

The Asiatic Society

1, Park Street, Calcutta-700 016

Book is to be returned on the Date Last Stamped

Date

Voucher No.

7 SEP 1994

7 SEP 1994

12913.

FIFTEENTH SESSION
OF THE
INDIAN SCIENCE CONGRESS
CALCUTTA, 1928

DESCRIPTIVE
GUIDE BOOK
TO
CALCUTTA & ITS ENVIRONS



Printed by N. Mukherjee, B.A., at the Art Press
31, Central Avenue, Calcutta
and
Published by the Local Secretaries of the Congress,
Senate House, College Square, Calcutta.

CONTENTS.

	PAGE.
CHAPTER I.—A Short History of Calcutta	1
CHAPTER II.—General Description of Calcutta and Necessary Information	28
CHAPTER III.—Calcutta's Climate, Seasons, and Population ...	42
CHAPTER IV.—Principal Educational Institutions	51
CHAPTER V.—Museums, Libraries, Societies, and Research Institutes	89
CHAPTER VI.—Other Educational Institutions in and near Calcutta	115
CHAPTER VII.—(1) Public Administration in Calcutta	133
(2) Health Statistics	134
(3) Parks and open Spaces	136
(4) Recreations	137
CHAPTER VIII.—The Romance of Trade	141
CHAPTER IX.—Places Worthy of a Visit in and near Calcutta	165

PLATES.

1. Senate House, Calcutta University ...	Frontispiece.
2. Presidency College	To face p. 70
3. St. Xavier's College	„ „ „ 73
4. Islamia College	„ „ „ 86
5. Victoria Memorial	„ „ „ 91
6. Asiatic Society of Bengal	„ „ „ 96
7. The Bose Research Institute	„ „ „ 110
8. <i>Sangit Sangha</i> Students	„ „ „ 119
9. Bengal Technical Institute	„ „ „ 122
10. Bengal Chemical and Pharmaceutical Works	„ „ „ 156
11. Dakshineswar Temples: and Alipore Obser- vatory	„ „ „ 169
12. Map of Calcutta	At end.

CHAPTER I.

A SHORT HISTORY OF CALCUTTA.

HINDU MYTHOLOGY.

As in the case of other cities, a legend is associated with Calcutta. Long, long ago, in the beginning of time, there lived the great god *Siva* in *Kailasa*, high among the snow-clad Himalayas, rapt in eternal meditation. His consort *Sati*, also called *Kali*, represented *Sakti* or the Primal Force.

Sati's father, so runs the story, had invited all the gods to a great sacrifice but not his son-in-law *Siva*, who lived like a religious mendicant. *Sati* could not bear this insult to her husband, and she died in grief. When *Siva* heard about it, up in *Kailasa*, he made straight for the body of *Sati* and took it up gently in his lap. This great grief of the great god has not only been told in Hindu mythology but it also appears in the frescoes of Ajanta and in recent times in a famous picture of a Bengali artist, Mr. Nanda Lal Bose.

But *Siva* could not sit still. After a short time he jumped up, threw the body of *Sati* on his shoulders and rushed hither and thither through the realms of nature dancing his elemental *Tandaba* dance. The whole world was threatened with destruction. Then *Visnu* came behind *Siva* and threw his discus time after time at the corpse of *Sati*, cutting it into 51 pieces, which fell in 51 places in different parts of India. Every such place became a sacred spot full of the divine spirit of *Sati*. The most celebrated of them all is *Kalikshetra* or *Kalighat** (modern Calcutta), the place which received a toe of the right foot of *Sati* or *Kali*.

The temple of the goddess at *Kalighat* in Southern Calcutta is every year visited by hundreds of thousands of pilgrims.

*The earliest mention of *Kalighat* in Bengali literature is to be found in a poem in praise of the Serpent-goddess, *Manasa*, by *Vipradasa Pittal*, c. 1495 A.D. In another Bengali poem, *Chandikavya* by *Mukundarama Chakravarti*, probably written some time between 1577 and 1597 A.D., *Kalighat* is mentioned as one of the places visited by the hero, *Dhanapati*. In a third poem, written about the same time by *Kshemananda*, the blessings of all the gods and goddesses, including *Kali* at *Kalighat*, are invoked.

THE PORTUGUESE IN SATGAON.

The first historical mention of Calcutta is to be found in *Ain-i-Akbari*, a book written in 1596 by Abul Fazl, the Prime Minister of the Emperor Akbar. It is stated there that the Sarkar (*i.e.*, district) of Satgaon (modern Hughli district), in which was included the village Kalkatta or Calcutta, paid into the Imperial Exchequer an annual revenue of Rs. 23,405. *Satgaon* or *Saptagrama* came to be an important inland port at about that time. It was situated a few miles to the north-west of the modern town of Hughli, near the station of Magra on the E. I. Railway. The river *Sarasvati*, now silted up, flowed below it, a little to the west of the river Hughli, which it rejoined a few miles below Calcutta near Garden Reach. In fact, *Satgaon* was the *Porto Piqueno*, or Small Haven, of the Portuguese in Bengal, who had already established their *Porto Grande*, or Great Haven, at Chittagong. The difficulty was that the sea-going vessels could not go right up to *Satgaon*; they had to be anchored near Garden Reach. As soon as the foreign ships appeared, innumerable thatched houses were set up and all sorts of stores and provisions brought to the water side. The big vessels remained at anchor, while small country boats went up the river and returned with silks, muslins, lac, sugar, rice and other articles of export. As soon as the cargo was shipped, the improvised houses of bamboo and straw were set on fire, and no trace remained there of the once brisk trade centre, save the smouldering ashes.

FROM SATGAON TO CALCUTTA.

Satgaon could not enjoy its prosperity for any length of time on account of the shifting course of the *Sarasvati*, which was as freakish as any other river in Bengal. The great majority of merchants settled at Hughli, on the same side of the river as *Satgaon*. But four families of Basaks, a noted caste of Bengali weavers, and a family of Sets, a caste of merchant-bankers, who had settled in Bengal years ago, went over to the other side of the river Hughli, close to the deep waters, where they could more advantageously trade with the Portuguese adventurers at Garden Reach. In the corner of the swampy land, between the Hughli and Tolley's Nala, they built a village which they named *Govindapur* in honour of their tutelar deity.

North of this, beyond the creek, which ran where Hastings Street now is, and which is still commemorated by Creek Row, they established Sutanuti Hat, or Cotton Yarn Market.

THE PORTUGUESE DRIVEN OUT.

As stated above, the vast majority of merchants of *Satgaon* settled at Hughli, which rapidly rose in prosperity. The Portuguese secured favours from the Emperor Akbar and by 1599 had provided themselves with a Church and a fortress. Unfortunately, however, the early intrepid adventurers gradually were succeeded by a race of pirates who mixed their blood, and were in close alliance, with the aboriginal pirates of Arracan, who infested the "Rogues' River" at the entrance of the Hughli. This brought down the vengeance of the Emperor Shah Jehan, and in 1632 the town of Hughli was captured and the entire population carried off as slaves to Agra. With the fall of Hughli came Calcutta's opportunity; the Sets and the Basaks improved their business. In fact the temporary straw shelters on the other side of the river near Garden Reach had no longer to be set up year after year only to be destroyed, but were replaced by more permanent structures.

THE DUTCH AND THE ENGLISH.

The Dutch followed the Portuguese in Bengal and by 1625 had set up an establishment at Chinsurah, now a station on the E. I. Railway. The English had been carrying on trade in Madras and Orissa all this time. It was not until the middle of the seventeenth century that they ventured up the river Hughli. They received a charter from Prince Shuja (the viceroy of Bengal under Shah Jehan) allowing them to carry on their trade in Bengal subject to the payment of Rs. 3,000 a year. Late in the 17th century the English in Bengal declared war against the Mughal power as a protest against vexatious interference with their trade by the local officers. The English Company's agent, Job Charnock, ransacked Hughli in 1686, but on the Nawab of Bengal sending up troops in retaliation, Charnock was compelled to leave Hughli, and made a halt at Sutanuti (in December 1686) and demanded compensation. The angry Nawab sent troops again. But, eventually, he was prevailed upon to accord

permission to the English to carry on their trade at Hughli as before. Next year (in September) Charnock stopped at Sutanuti again to "recruit provisions" and "spin out the monsoon." Charnock was superseded by Captain Heath at about this time, but after a brief withdrawal to Madras, he, with his council, returned to Sutanuti for the third time in 1690, attracted by the generous offer of Rs. 60,000 by way of compensation made by the new Nawab, Ibrahim Khan, who has been described by contemporary writers as "the most famously just and good Nawab of Bengal."

"CHARNOCK'S MIDDAY HALT."

This historical event is chronicled by Charnock himself in the following words :—

"August 24, 1690. This day at Sankral (a village on the west bank of the Hughli below Sibpur) ordered Captain Brooke to come up with his vessel at Sutanuti, where we arrived about noon, but found the place in a deplorable condition, nothing being left for our present accommodation. The rains falling day and night, we are forced to betake ourselves to boats, which considering the season of the year, is unhealthy. Malik Barkhurdar and the country people, at our leaving the place, burning down and carrying away what they could."

FIRST "CONSULTATION."

In this "Diary and consultation Book for the affairs of the Rt. Hon'ble East India Company kept by the Rt. Worshipfull the Agent and Council" is also to be found a record of the first "consultation" held four days later by the restored Bengal Council. There were present "the Rt. Worshipfull Agent Charnock, Mr. Francis Ellis and Mr. Jere (miah) Peachie" and "in consideration that all the former buildings here are destroyed, it is resolved that such places be built as necessity requires and as cheap as possible . . . these to be done with mud walls and thatched roofs till we get ground wherein to build a factory . . ."

KIPLING'S DESCRIPTION.

In the words of Kipling,

“Once two hundred years ago the trader came
 Meek and tame
 Where his timid foot first halted there he stayed,
 Till mere trade
 Grew to Empire and he sent his armies forth,
 South and North;
 Till the country from Peshawar to Ceylon
 Was his own.
 Thus the mid-day halt of Charnock—more's the pity,
 Grew a city;
 As the fungus sprouts chaotic from its bed,
 So it spread—
 Chance-directed, chance-erected, laid and built,
 On the silt.
 Palace, myre, hovel—poverty and pride,
 Side by side;
 And above the packed and pestilential town
 Death looked down.”

More briefly we have it in the “Song of the English”

Me the Sea-Captain loved, the River built,
 Wealth sought and Kings adventured life to hold
 Hail England! I am Asia, power on silt,
 Death in my hands, but gold!

WAS CALCUTTA “CHANCE-ERECTED.”

Was Calcutta really “chance-directed, chance-erected,” as stated by Kipling? Charnock deliberately turned down the Nawab's offer of an asylum at Hughli. For he rightly realised that Calcutta, being nearer the sea than Hughli, not only afforded better facilities for trade but also for withdrawal into safety in case of defeat. The situation on the eastern bank of the river rendered it strategically more secure from attacks by Mahrattas and Mughals. The place was free from the political intrigues current in Hughli, and land was cheaper. Yet Calcutta was not a howling wilderness. The Sets and

the Basaks had already set themselves up. The pilgrim's road leading to Kali's temple (modern Chowringhee with its northern and southern extensions) provided as good a communication with the interior as was possible in those times. Provisions were plentiful and the soil fertile.* On the east side it was protected from invasion by an extensive salt lake. The only difficulty was that the place was swampy and unhealthy.

THE BAITAKKHANA.

All this is not merely an after-thought, as suggested by some writers. If tradition is to be believed, Charnock meditated on these manifold advantages of Calcutta under the spreading peepul tree, which stood at the junction of the Bowbazar Street with Lower Circular Road, when, in common with other European traders, he halted on his way to Hooghli. It was the favourite *Baitakkhana*† or *rendezvous* of all traders where they enjoyed their *hookkas* in a leisurely way in those leisurely days. The historic tree stood there throughout the eighteenth century but was removed as late as 1820, under orders of the Marquess of Hastings, in connection with his plans for the improvement of the city.

CALCUTTA UNDER CHARNOCK.

Charnock as Governor gradually grew into an irresponsible autocrat. According to Captain Alexander Hamilton, he "reigned more absolute than a Raja, only he wanted much of their humanity, for when any poor ignorant native transgressed his laws, they were sure to undergo a severe whipping for penalty and the execution was generally done when he was at dinner, so near his dining room that the groans and the cries of the poor delinquents served him for music." It is also stated that he married an Indian wife and sacrificed a cock every year on her death anniversary on her grave, in which, as tradition has it, he was himself laid, after his death on January 10, 1692.

*The Emperor Aurangzib described Bengal as a "Hell full of good things."

†The locality still goes by the name of Baitakkhana.

THE CHARNOCK MAUSOLEUM.

His son-in-law Charles Eyre erected a mausoleum* over the tomb which is still to be found in St. John's Church-yard, although not in its original form, it having been repaired by the Public Works Department in 1892. The Rev. H. B. Hyde, at that time Chaplain of St. John's, took the opportunity of examining the tomb, but could say nothing either for or against the tradition that Charnock had been laid in his wife's grave.

ESTIMATE OF CHARNOCK'S CHARACTER.

The following estimate of Hunter is probably not beside the mark :—

"Charnock now stands forth in the manuscript records as a block of rough-hewn British manhood. Not a beautiful person, perhaps, for the founders of England's greatness in India were not such as wear soft raiment, and dwell in Kings' houses; but a man who had a great and hard task to do, and who did it with small thought of self,† and with resolute courage which no danger could daunt nor any difficulties turn aside." Charnock was succeeded by his second in command, Ellis, a man of little character or ability. Although an Imperial order had been obtained as early as 1691, permitting the English to "contentedly continue their trade" on payment of Rs. 3,000 a year by way of all dues, yet nothing had been done to clear jungles, construct roads or build houses. The early traders lived either in mud hovels or in the cabins and forecastles of their ships, or worse still, in small country boats, in the stifling heat and torrential rains of Calcutta. It is no wonder that living in such surroundings, they fell an easy prey to tropical diseases.‡

EARLY YEARS OF CHARLES EYRE.

Charles Eyre, who now became the Agent, was a man of commanding personality and character, full of initiative and enterprise.

*This is believed to be the earliest piece of masonry erected by the English.

†He is gratefully described in State papers as "always a faithful man to his Company."

‡In a General Letter to the Court of Directors date Fort. St. George, May 25, 1691, it is stated, "They lived in a wild, unsettled condition at Chuttanutte (sic), neither fortified houses nor godowns, only tents, huts and boats."

Within a few months of his assumption of office, the Agent's *cutchu* house caught fire and was promptly rebuilt of brick. But being considered to be "a considerable distance from the factory, it was disposed of by outcry and fetched Rs. 575/-". A minute of June 25, 1695, records a severe storm which blew down many of the houses erected by Eyre, notably the "lodging rooms" for the servants of John Company.

COMMENCEMENT OF THE OLD FORT.

But the event for which Eyre's administration is chiefly noted was the rebellion of Shova Singh, Chief of Chatwa-Barda (in Midnapore) in 1696 and the use Eyre made of it in fortifying Calcutta. When Shova Singh seized Hughli and Murshidabad and was preparing to advance on Sutanuti, the Nawab was obliged to accord the long-delayed permission to the English "to defend themselves." As early as 1693, Sir John Goldsborough had selected a site for a factory and had enclosed it with a mud wall. The spot chosen was the highest piece of ground on the bank of the river, which then flowed much further east than now, the present Strand Road then being part of the river bed. The actual site is now occupied by the General Post Office, the Customs House and East India Railway House.* Fortifications were hurriedly run up and continued even after the withdrawal of Shova Singh. By January 1697, a bastion and a walled enclosure were completed and ten guns were ordered from Madras.

COMPANY'S INCREASED PRESTIGE.

Apart from this tangible benefit, the Company derived another and infinitely more valuable advantage from Shova Singh's rebellion. The people saw the whole country-side to the west of the Hugli pillaged by the rebels, who were, however, kept at a safe distance from Calcutta. Charnock's choice was thus more than justified by this incident. Bankers, traders, manufacturers and wealthy people generally came to Calcutta as to a safe haven in those stormy times.

*The modern Koila Ghat is probably Killa Ghat, i.e., landing place near the fort.

COMPANY SECURES COURT FAVOUR.

Prince Azim-us-shan the Governor of Bengal, accepted Rs. 16,000 from the English and granted them the eagerly sought permission to buy from their proprietors the three villages of Govindapur, Sutanuti and Calcutta in full ownership on August 1, 1698.

CALCUTTA BOUGHT FOR Rs. 1,300/-.

The rest was plain sailing. The permission to purchase cost Rs. 16,000/- but the properties were bought for a mere song, only Rs. 1,300/-. The *bainama* or deed of sale ran as follows :—

“We, submissive to Islam, declaring our names and descent ;
 being in a legal capacity and in enjoyment of all the
 rights given by the law, avow and declare upon this wise ; that we
 conjointly have sold and made a true and legal conveyance of the
 villages Dihi Kalkatah and Sutanuti and the village
 Govindpur to the English Company with rents and
 uncultivated lands and ponds and groves and rights over fishing and
 woodlands and dues from resident artisans, together with the lands
 appertaining thereto, bounded by the accustomed notorious and usual
 boundaries, the same being owned and possessed by us
 in exchange for the sum of one thousand and three hundred rupees,
 current coin of this time, including all rights and appurtenances
 thereof, internal and external, we have caused to be
 written and have delivered these few sentences that when need arises
 they may be evidence. Written on the 15th of the month Jamdi I
 in Hijiri year 1110,* equivalent to the 44th year of the reign full of
 glory and prosperity.”

NEW BUILDINGS.

In 1697, when the fort was first constructed, it had only one bastion and that simply a square tower with thick walls constructed so as “to look like a warehouse for fear of exciting the jealousy of the Mogul.” But when Charles Eyre, after receiving his knighthood in England, returned to the settlement as its first President in 1700, he brought out instructions for building a fort to be named after

*The date is 10th November, 1698 (Old Style).

William III. Two years later in 1702, the President's house was commenced. The Union Jack was hoisted for the first time in the settlement in the same year on October 6. It took four years to complete the President's house, which was described as "the best and most regular piece of architecture in India" by Hamilton. In 1706 the old factory house was pulled down and in its place was erected a single-storied house for the servants of the Company—the first "Writers' Buildings." But it was not till after the death of Aurangzeb in 1707 that the English had any real opportunity of fortifying the settlement. Amidst the general insecurity then prevailing, they hastily put up two more bastions on the river side. By this time other European merchants had built their houses on the eastern side of the fort, the western side being lapped by the Hughli. The pivot of the settlement was "The Green before the Fort," now called *Lal Dighi* by Indians, and Dalhousie Square by Europeans. It was then a dirty pond full of weeds but was deepened into a much needed reservoir of water in 1709. During the same year, the Church of St. Anne* was erected partly by State grant and partly by public subscription. In the next year, a wharf was commenced before the fort, faced with brick and with a breastwork for cannon.

THE GOVERNMENT.

The administration was carried on by a Council which met at nine o'clock in the morning at the beginning of every week. According to "An old country captain," quoted in the *Indian Gazette* of February 24, 1781, the members were "dressed in muslin shirts, pyjamas and starched white caps, sitting in the consultation room with a case bottle of good old arrack and a goblet of water on the table, which the Secretary with skilful hand converted into punch when the occasion arose." The Council had a President who had the distinction of being paid the princely salary of £100 a year in common with the Chaplain. There were eight other members "passing rich with forty pounds a year." To make matters worse, the exchange rate was officially fixed at 2s. 6d., that is, Rs. 8 a pound. But they had all responsible duties. The second and fourth members were usually the chiefs of Cossimbazar and Dacca factories, the third was

*Afterwards destroyed by the terrible cyclone of September 30, 1737.

the Accomptant; the fifth and the sixth, the Export and Import Warehouse Keepers; the seventh the Paymaster; the eighth, the Collector or to give him his own name, the Zemindar; the ninth and the last member was the Secretary. The "Zemindar" was a collector of revenue as well as a judicial officer; it was part of his duty to "make roads and repair drains."

SOCIAL LIFE.

Captain Hamilton has described the social life of the time in his usual graphic manner in the following words :—

"Most gentlemen and ladies in Bengal live both splendidly and pleasantly, the forenoon being dedicated to business, and after dinner to rest, and in the evening to recreate themselves in chaises or palanquins* in the fields, or to gardens, or by water in their budgeroes, which is a convenient boat which goes swiftly with the force of the oars. On the river sometimes there is the diversion of fishing or fowling, or both; and before night they make friendly visits to one another when pride or (and?) contention do not spoil society, which often they do among the ladies, as discord and faction do among the men The colony has very little manufactory of its own, for the Government being pretty arbitrary, discourages ingenuity and industry in the populace It may contain, in all, about ten or twelve thousand souls".

MISSION TO DELHI.

An embassy was sent from Bengal to Delhi where it arrived on July 8, 1715, with presents to the value of £30,000, but it was not until January next year that the English agents could secure permission to see the Emperor. Even then the mission might have been unsuccessful, had not Surgeon Hamilton of the embassy been permitted to attend the Emperor in his illness and restore him to health. At all events the English were granted the long desired *farman*, but not till after a tedious delay of two long years. Surgeon Hamilton died on December 4, 1717 shortly after his successful return.

*I.e., box litters carried on long poles by four, six or eight men, the usual vehicle in the absence of good roads.

HAMILTON'S TOMB.

Within the Charnock mausoleum is the tombstone of Hamilton, which, in addition to the Persian inscription, contains the following epitaph in English :—

“Under this stone lyes inserted the body of William Hamilton, Surgeon, who departed this life the 4th December, 1717.

“His memory ought to be dear to this nation, for the credit he gained English in curing Ferrukseer, the present King of Indostan, of a Malignant Distemper, by which he made his own name famous at the court of the Great Monarch; and without doubt will perpetuate his Memory, as well in Great Britain as all other Nations in Europe.”

AFTER THE EMBASSY.

The *farman* authorised the English to purchase 37 villages contiguous to the three villages of Govindapur, Sutanuti and Calcutta. Round these as a nucleus grew up a city providing the utmost freedom and security in those troublous times. The land actually occupied was about 2000 acres, and in ten years' time the shipping amounted to ten thousand tons per annum. “The city increased yearly in wealth, beauty and riches.”

THE MAHRATTA DITCH.

The first check to the progress of Calcutta was offered by the terrible storm of September 30, 1737. According to a contemporary account, fifteen inches of rain fell in five hours, which, together with the violent earthquake, threw down most of the buildings including the Church of St. Anne. Another calamity befell the city five years later when the Mahrattas invaded Bengal, laying waste the entire country-side to the west of the river Hughli. The English obtained the permission of the Nawab “to dig an entrenchment round their territory. This work, had it been completed, would have extended seven miles. In six months, three miles of it were finished when the inhabitants, finding that the Mahrattas did not approach Calcutta, desisted from their works.” The original scheme was to plant seven batteries in different parts of the town which was actually done. The

Ditch was an after-thought, and, as stated above, merely half finished. The line of the ditch remains in the present Circular Road, although all traces of the batteries have vanished. And even temporary settlers in Calcutta still proudly call themselves "Ditchers."

GENESIS OF THE TROUBLES OF 1756.

Of infinitely greater consequence to Calcutta, and indeed to all India, was the growing tension between the English and the young Nawab Siraj-ud-Dowla who ascended the throne in 1756. The latter looked with misgiving on the fortifications which were being put up at Calcutta. But his resentment broke into open hostility when the English refused to deliver up to him the son of his Dacca Governor, who had fled with all his father's treasures to Calcutta to evade paying the Government dues to the Nawab. The English applied for help to the factory at Madras and also to the French and Dutch factories at Chandernagore and Chinsurah. But as no reinforcements arrived, they prepared unaided to defend themselves. They armed all the Europeans, native Portuguese, Armenians and 1500 Hindu matchlockmen. Even the chaplain was enrolled as a "Captain-Lieutenant." A store of grain and other provisions was laid in. Some fortifications were hurriedly run up, as far as the shortness of the time permitted.

CALCUTTA ATTACKED.

On Wednesday, June 16, 1756, the Nawab's army reached Chitpore, where it was repulsed by the battery of the Bagbazar outpost.* Emboldened by the enemy's retreat to Dumdum, the English burnt the bazar in front and to the south of the Fort on the next day. But on the 18th the Nawab's army reappeared in great force and drove in the English outposts after severe fighting near the present British Indian Street, still called "*Ranimuddi Gully*." The church and the buildings commanding the Fort were abandoned. Heavy guns were at once mounted on the roofs by the Nawab's army, and there was a fusillade of fire on the Fort.

*The locality derives its name from Perrin's Garden, once the fashionable resort of European ladies and gentlemen.

THE FORT EVACUATED.

A Council of War was now held, for the position was indeed desperate. It was decided to send the women and children on board the vessels lying off the Fort. And the entire night was spent in making preparations for meeting the storming of the Fort, which was regarded as inevitable. As chronicled by Holwell, "Early on morning of the 19th, the President Mr. Mackett and the Reverend Mr. Mapletoft, myself and others were employed in cutting open the bales of cotton and fitting it in bags to carry upon the parapets." At half past ten o'clock, the only two remaining boats at the wharf were manned by Governor Drake and others, who hurriedly rowed to the ships, alleging that the rout was general.

SIRAJ-UD-DOWLA CAPTURES THE FORT.

At this cowardly flight of the Governor, the command fell to Holwell, who with his little garrison continued the defence in a most valiant manner. This heroic band struggled on throughout the 19th, and the 20th, but after many losses the survivors were at last overpowered, and in the evening, the Nawab was in possession of the Fort. The Nawab's first concern was to discover and seize the English treasure. After a close but fruitless examination of Holwell and a few others, he left for his tent, without troubling himself about the prisoners any further. At first the English captives were left free and in comfort; but some soldiers procuring wine, got drunk, and began to assault the Indians. The Nawab's guards then put the prisoners into the Fort prison, called the Black Hole (Hill's *Bengal* in 1756-57).

THE BLACK HOLE TRAGEDY.

This was a small cubicle, 18 feet by 14 ft. 10 inches, with two small grated windows, to the south of the eastern gate of the Fort which served as a lock-up for recalcitrant soldiers. The story that the prisoners put into the Black Hole numbered 146 must be an exaggeration, as it is not physically possible to cram 146 persons into a room of the size stated. During the sultry summer night many of the prisoners sank down and expired through thirst and suffoca-

tion. When the door was opened in the morning, "twenty-three ghastly figures, such as their own mothers would not have known, staggered one by one out of the charnel-house."

ITS AUTHENTICITY.

Mrs. Carey, a reputed survivor of the Black Hole, who was reported by Holwell and Macaulay to have been sent to the Nawab's harem, in fact "remained in or near Calcutta and very soon married again, her second husband being a military officer of field rank, as stated to Dr. Busteed by "a near connection by marriage of a direct lineal descendant of Mrs. Carey." The precise details of the Black Hole story are, it is clear, open to considerable historical doubt. But, to quote Dr. Vincent Smith, "it is indispensable to observe that recent attempts to discredit the story as an invention are not well founded. The incident certainly occurred, although some uncertainty may exist concerning one or other detail."

ALINAGORE.

After the capture, the name of Calcutta for a short time disappeared from the pages of History. Siraj-ud-Dowla celebrated his victory by declaring with tom-tom that its name was to be henceforth "Alinagar." The seat of the Governor appointed by him was three miles to the south of the Fort and was called, then as now, *Alipur*. He commanded certain buildings to be demolished (not all, as stated by certain writers), and ordered the erection of a mosque with their materials inside the Fort. Most of the survivors were set at liberty, Holwell and three others being sent as prisoners of war to Murshidabad, to which the Nawab himself proceeded.

CALCUTTA RETAKEN.

The news of the fall of Calcutta and the tragedy of the Black Hole reached Madras on August, 16, 1756. Exactly two months later, on October 16, the avenging army, under the command of Clive and Watson, set sail, reaching Fulta on December 20. Clive's troops landed on the east bank and easily captured the fortress at Budge-Budge on the way. Admiral Watson sailed up, and at his

approach the Nawab's garrison speedily evacuated the Fort. On January 2, 1757 the British flag was rehoisted at Fort William. A "consultation" on that day declared the President and Council once more in possession. Clive first removed the neighbouring buildings which commanded the Fort. A moat 30 ft. wide and 12 feet deep was dug round the Fort. Other defences were also raised. By January 28, 1757, Clive was able to report to Madras as follows :— "I may assure you, Fort William cannot be taken again by the Moors but by cowardice." On February, 9, a treaty was concluded with the Nawab not only restoring the *status quo ante* but with some added privileges.

CALCUTTA AGAIN THREATENED.

In the meantime war having broken out between England and France, Clive and Watson captured Chandernagore. An open rupture followed between the English and the Nawab, who regarded the French as his allies. Clive wrote a strong letter demanding satisfaction for all past wrongs, without however mentioning the Black Hole incident. The Nawab's reply was an immediate advance of his army. Clive also set his army in motion, making a halt at Katwa till June 22, partly on account of a severe storm and partly in order to get some authentic news from the Court at Murshidabad before embarking on his desperate enterprise.

INTRIGUES AND TREACHERIES.

From the moment of the retaking of Calcutta, there were intriguers at Murshidabad who wished to depose Siraj-ud-Dowla and set up his uncle Mir Jaffer as the puppet Nawab, with the aid of the English. Clive decided to take advantage of the intrigue and replace Siraj-ud-Dowla by Mir Jaffer. Mir Jaffer accordingly executed a treaty with the British. Amin Chand, the rich Sikh banker, was in the plot, but threatened to betray it, unless a bribe of 30 lakhs of rupees was promised to him on behalf of the English. This was to be contained as a special clause in the treaty with Mir Jaffer. Two treaties were prepared under Clive's instructions; the genuine treaty on white paper was without that clause, the second on red paper contained that clause, and on it Admiral Watson's signature was forged.

BATTLE OF PLASSEY.

At last the uncertainty was over. A reassuring letter came from Mir Jaffer who solemnly promised to abide by his treachery. Luckily for the English, throughout the fateful battle of Plassey, Mir Jaffer did not dare to prove false to them, even though Siraj-ud-Dowla put his turban at his feet and entreated him to remain loyal. Clive then made up his mind and crossed the river Ganges, reaching the field of Plassey in the midst of a terrible storm at 1 a.m. in the morning of June 23rd. The odds were immense. To the Nawab's force of 50,000 infantry, 18,000 horse and 53 guns, mostly thirty-two, twenty-four and eighteen pounders, Clive could reply with only 1,020 European soldiers, 2,020 Indian soldiers and 8 guns, all five-pounders. The treachery of Mir Jaffer was reinforced by another malcontent, the treachery of Rajah Durlav Khan, who persuaded Siraj-ud-Dowla to seek safety in flight, after which there was a general debacle. There was no real battle, but only a distant cannonade, followed by the English advance and their storming of the French posts in front of the Nawab's camp. Then came the retreat of Siraj-ud-Dowla's forces to their camp, and the Nawab's flight, which led to the dispersion of his army. The loss on the English side was 7 killed and 13 wounded among the European soldiers, and 36 killed and an equal number wounded among the Indian soldiers.

It was a great victory, if not of British arms, certainly of British diplomacy. As a matter of fact, it was Plassey which made Calcutta the capital of British India. Mir Jaffer readily consented to yield Zemindary rights to the English, the deed containing this remarkable sentence, "Know this, ye Zamindars...and others settled in Bengal,...that ye are dependents of the Company and that ye must submit to such treatment as they give you, whether good or bad, and this is my express injunction." Lavish compensation was awarded to the Company and its officers, a portion of which was utilised in rebuilding the city, constructing a new fort,* a mint and other public buildings. Presents comparable to Tudor benevolences were heaped on Clive and other servants of the Company. The controversy about this huge treasure, known as the "Plassey Drain" has probably provoked more critical speeches and writings, than any other con-

*The present fort was begun in 1758 but not completed till 1773.

troversy in Anglo-Indian history. Recently, a careful estimate has been made from contemporary state records by Prof. J. C. Sinha of Dacca University, who puts down the figure at £38,000,000 as the minimum amount of "drain" from 1757 to 1780. It must be remembered in this connection that the purchasing power of money was then at least five times as high as now.

MAKING AND UNMAKING OF KINGS.

Apart from this material treasure, there was the incalculable treasure of prestige and power possessed by the Company, without, however, any responsibility for the good government of the country. The mint still issued coins bearing the name of the Moghul Emperor. In law, the Company had merely subsidiary zemindari rights and was not paramount sovereign. But this was theory and not actual fact.

"PALACES AND HOVELS."

Whatever was the fate of the people of Bengal during these political troubles when the English were in power without responsibility, Calcutta prospered beyond measure. But the absurdities of wealth check by jowl with poverty were everywhere in evidence. Although splendid country houses sprang up in the suburbs—one at Dumdum for Clive, another at Alipur for Hastings, connected with Calcutta by a bridge across Tolley's Nullah, and quite a number on the banks giving the locality its name of Garden Reach,—yet the city was a conglomeration of palaces and hovels. According to a contemporary writer, "The appearance of the best houses (in Calcutta) is spoiled by the little straw huts and such sort of encumbrances, which are built up by the servants for themselves to sleep in, so that all the English part of the town.....is a confusion of very superb and very shoddy houses, dead walls, straw huts, warehouses and I know not what."

LARGE ESTABLISHMENTS.

An immense number of servants was kept, in addition to slaves. "One hundred and ten servants to wait upon a family of four people" writes Macrabie, Secretary and brother-in-law of Francis, "and yet we are economists. Oh, monstrous! Tell me if this land does not want weeding."

SOCIAL CUSTOMS.

Early rising was the rule and a morning ride was frequently indulged in. According to a contemporary writer, "at four O'clock in the morning while it is yet utterly dark, there is an universal stir throughout the house, much talk of horses, hats, whips and coffee; and a voice at the door enquiring whether a ride or a drive would be preferable." Work also began early, the hours at Public offices being from 9 o'clock to 1 in the morning and 7 o'clock till 9 in the evening. Dinner was served at 2 and was a huge affair. Much wine was drunk.*

The rage for smoking," wrote a chronicler in 1789, "extends even to the ladies; and the highest compliment they can pay a man is to give him preference by smoking his *hookkah*." To continue, in the words of another contemporary chronicler, "the custom of reposing, if not of sleeping, after dinner is so general that the streets of Calcutta are, from four to five in the afternoon, as empty of Europeans as if it were midnight. Next come the evening airings on the course, where every one goes, though sure of being half suffocated with dust. On returning thence, tea is served, and universally drunk here even during the extreme heats. After tea, either cards or loo fill up the space till ten, when supper is usually announced. Formal visits are paid in the evening; they are generally very short, as perhaps each lady has a dozen calls to make and a party waiting for her at home besides. Gentlemen also call to offer their respects, and if asked to put down their hats, it is considered as an invitation to supper."

DUEL AT ALIPUR.

The constant conflict between Hastings and Sir Phillip Francis culminated in a duel in 1780. The immediate cause was the following statement made by Hastings in a state paper and subsequently read by him before the Council. "I do not trust to Mr. Francis's promises of candour, convinced that he is incapable of it. I judge

*A wag in the *Calcutta Gazette* of October 9, 1788 suggests the following "Guides to health"—"The gentlemen are particularly entreated not to eat above four pounds of solids at a meal, or drink above six bottles of claret. Dancing will be extremely fatal to the ladies, if taken more than three times a week, and they are positively forbid to wear full dresses of either satin or velvet, until the 1st of November."

of his public conduct by his private, which I have found to be void of truth and honour". After the Council had risen, Francis slipped a written challenge into the hands of Hastings who immediately accepted it. The duel was fought in Alipur on August 17th.*

Francis was shot in the right side, but not dangerously. An account of the duel in the handwriting of Hastings is still available in the Victoria Memorial Hall.

TRIAL OF NANDA KUMAR.

Another event attributed to this quarrel between Hastings and Francis was the trial and execution of Maharaja Nanda Kumar on a charge of forgery. The rights and wrongs of this incident, which has been indicated by one party as "a judicial murder", and the narration of which gave full play to Macaulay's imagination and love of effect, have been critically examined by a number of historians. It will be sufficient therefore to state the facts without any comment. Fully capable and a man of address, Nanda Kumar rose steadily in the Murshidabad Durbar. Intriguing for power, he tried to bring about the downfall of the two highest officers under the Nawab but was unsuccessful. A similar attempt was made to bring about the downfall of Hastings with the assistance of Francis by making serious allegations before the Council on March 11, 1775. The letter tendered in evidence ultimately proved to be forged and Hastings proposed to put him on trial. But this matter was dropped. The trial really arose out of a separate transaction altogether, a private litigation of long standing. There was a regular trial with the aid of a jury regularly empanalled after the Maharajah had exhausted eighteen out of the twenty challenges permitted by law. The verdict of guilty from the jurors left no alternative to the judges, who pronounced the only sentence possible in those rigorous times, when men were hanged for far less serious offences than forgery. The condemned man applied to the Council, where Francis with his standing majority could have saved his life if he had so desired and dared. The verdict was convenient to Hastings—one cannot go further than that with safety.

*According to Dr. Busteed, "Unless records or trustworthy tradition point to another locality I am inclined to think that the compound of No. 5, Alipur Road holds near its northern boundary the site of this memorable duel."

WORK OF HASTINGS.

The work of Hastings has been chronicled by many able historians. Our concern however is chiefly with what he did for Calcutta. As President of the Building Committee of St. John's Church-yard, he not only secured a free gift of land from Maharajah Nabakissen, but he also gave liberal state aid and permitted certain unauthorised diversion of state monies.*

It was under his auspices that the Asiatic Society of Bengal came to be founded in 1784. He was in fact elected the first President, "but with excellent taste and feeling, he declined the honour in favour of Sir William Jones." The seeds of the Royal Botanic Garden at Sibpur were also laid during his *régime*, both literally and metaphorically.†

It was in this garden that Colonel Kyd made his earliest experiments with the transplantation of foreign plants into Bengal, which ultimately set up one of Bengal's greatest industries, the tea industry, during the middle of the nineteenth century. During the rule of Hastings, the administration came to be centralised more and more in Calcutta. He might not have had anything to do with the setting up of the Supreme Court, but it was he who removed the *Khalsa*, or Exchequer, from Murshidabad to Calcutta. It was he, again, who abolished the five Provincial Revenue Councils at Burdwan, Dacca, Dinajpur, Murshidabad and Patna and set up the Committee of Revenue in Calcutta.

SOCIAL LIFE IN THE DAYS OF CORNWALLIS.

The administration of Cornwallis was mainly one of consolidation. He carried out many of the measures initiated by Hastings, who, had not, like Cornwallis, the power of overriding his Council. Life in Calcutta was much the same as before. He described it to his

*As Sir John Shore has put it, "A pagan gave the ground, all characters subscribed: lotteries, confiscations, donations received contrary to law were employed in completing it." Although, according to Shore "the Company contributed but little," yet the total contribution by the Government, both direct and indirect, was not inconsiderable. See the ten statements of accounts issued by the Building Committee, the first published in the *Calcutta Gazette* of April 26, 1787, and the second embodied in the minutes of the Consultation held in September 11, 1789 preserved in the Imperial Record Office, Calcutta.

†The Royal Botanic Garden was actually established during the short rule of Sir John Macpherson, in 1786, who strongly recommended the measure to the Court of Directors.

son at Eton in the following terms:—"I get on horseback just as the dawn of day begins to appear, ride on the same road and the same distance; pass the whole forenoon after my return from riding in doing business, drive out in a phaeton a little before sunset, then write or read over letters or papers on business for two hours; sit down at nine to some fruit and a biscuit, and go to bed after the clock strikes ten." Public ceremonies were held in the mornings. It was the custom of Cornwallis, who did not set much store by formalities, to give the word of command, "off coats" as soon as he sat down to table, in order to make his guests more comfortable.

BEGINNINGS OF MUNICIPAL ADMINISTRATION.

It was during the administration of his successor, Sir John Shore, afterwards Lord Teignmouth, that the *Zemindar*, or to give him his new appellation, the Collector, was relieved of his municipal duties in 1794 under the statute 33 Geo. III, the Governor-General being empowered to appoint Justices of the Peace for the municipal administration of the town with authority to make regular assessments and levy rates. The Justices set to work at once to improve the town. It is true that the Mahratta ditch which had become an open sewer had been filled up as early as 1780, yet the conservancy system was deplorable in the extreme. "The city was in fact little better than an undrained swamp, surrounded by malarious jungle and pervaded by a pestilential miasma." The Circular Road began to be metalled in 1799. In 1801, tenders were invited for the supply of 85 pairs of bullocks for conservancy purposes. But it was soon evident that mere tinkering by "Justicities" were of little avail for effecting any real improvement in the city.

WELLESLEY AND THE LOTTERY COMMITTEE.

It was left to Shore's successor, Lord Wellesley, to initiate a long programme of civic reform with his famous minute of 1803. His Improvement Committee bore a similar relation to the Justices as the Improvement Trust bears to the Corporation at present. This Committee was superseded by the Lottery Commissioners in 1814 and eventually in 1817 by the Lottery Committee. "In the order of

Government constituting the new Committee (of 1817), it was laid down that the Lottery Fund should be considered applicable to the expense of excavating new tanks and filling up old ones, of opening new streets or roads, of constructing aqueducts, bridges, ghauts, and other similar works calculated to improve the health, convenience, and comfort of the inhabitants of the city and suburbs, but not to the keeping in repair streets, roads, drains, or other works alluded to, when finished, and that, generally speaking, no expense should be charged to the fund which could properly be included in the assessment department."

CALCUTTA IN 1803.

Lord Valentia, who visited Calcutta in 1803, has left the following account of the improvements effected by Wellesley. "The town of Calcutta is at present well worthy of being the Seat of our Indian Government, both from its size and from the magnificent buildings which decorate the part of it inhabited by Europeans. The citadel of Fort William is a very fine work, but greatly too large for defence. The Esplanade leaves a grand opening, on the edge of which is placed the new Government House, erected by Lord Wellesley, a noble structure, although not without faults in the architecture, and upon the whole, not unworthy of its destination.*

On a line with this edifice is a range of excellent houses, chunamed and ornamented with verandahs. Chowringhee, an entire village of palaces, runs for a considerable length at right angles with it, and altogether forms the finest view I ever beheld in any city." The Black Town (*i.e.*, the Indian quarter) is as complete a contrast to this as can well be conceived. Its streets are narrow and dirty; the houses, of two stories, occasionally brick, but generally mud, and thatched, perfectly resembling the cabins of the poorest class in Ireland."

FALL OF AGENCY HOUSES AND BANKS.

From this time on, the progress of Calcutta is continuous. In 1813, under the new charter of the Company, the old monopoly was abolished and "interlopers" were permitted to trade in India side by

*It was commenced in 1797 and completed in 1803.

side with the Company on equal terms. The result was increased trade and increased prosperity to Calcutta. But this was completely eclipsed during the crisis of 1830-1834, when five of the Great Agency Houses of Calcutta failed. Another crash came in 1847 when the Union Bank failed with huge commitments in the most disgraceful circumstances imaginable. A contemporary English writer was constrained to make the following remark : "The commercial morality of Calcutta is a bye-word in every Chamber of Commerce in Europe. There is almost a total bankruptcy of character." Yet it was these merchant princes and banking houses and their successors who have made Calcutta what it is to-day.

NEW BUILDINGS AND NEW INSTITUTIONS.

The Town Hall, begun in 1805, was completed in 1813. During this latter year was also created the Bishopric of Calcutta although the first Bishop, Middleton, was not enthroned in St. John's till a year later. The foundation stone of St. Paul's was laid in 1839 and the Cathedral was consecrated in 1847. In 1831 was opened the new Mint, or the Silver Mint, the Copper Mint not being started till 1865. At about this time the Calcutta Trades Association, the oldest public body in Calcutta, came to be founded, the incorporation under the Companies Act taking place nearly half a century later in 1882. The Calcutta Chamber of Commerce, the progenitor of the Bengal Chamber of Commerce, was constituted in 1834, but not on the present site which is associated with the memory of Clive and Francis.* The two Misses Eden, the talented sisters of Lord Auckland, started the famous Gardens bearing their name at about this time.

BEGINNING OF MUNICIPAL GOVERNMENT.

The sanitary condition of Calcutta continued deplorable, especially in the Indian quarter of the town. Mr. (afterwards Sir) James Ronald Martin, the Surgeon of the Indian Hospital at Dhurru-m-tollah, drew pointed attention to the evils in his *Medical Topography of Calcutta*. A public meeting was held in the Town Hall and a

*It is believed that the present site was Clive's Government House and later the residence of Francis.

Committee appointed. Lord Auckland in his capacity as Governor of Bengal authorised the Committee to take evidence, added two members to their number, and directed them to undertake, in addition to the Hospital scheme, "the more difficult and important task of endeavouring to frame such a plan of Local Management and taxation as may be best calculated to secure efficiency and general confidence in the application of the fund collected." The final instalment of its Report was not issued till 1847. In the same year an Act was passed (Act. XVI of 1847) entrusting conservancy to a Board of seven Commissioners, three nominated and four elected. Another Act was passed during the same year (Act XXII of 1847) constituting the Commissioners a Corporate body with a Common seal with rights to hold real properties and institute legal proceedings. Act II of 1848 charged the Commissioners with the control and management of streets. The roads in Calcutta and its environs scarcely deserved the name and were in a terrible condition.

THE INDIGO TROUBLES.

The controversy following the Mutiny was scarcely over before there was another fierce agitation in Calcutta, in which the Indigo "factory journals" (the *Englishman* and the *Bengal Harkaru*) chose to oppose English officials and Indian public men in the interest of indigo planters in the moffussil, who were accused of cruelty to the helpless *ryots* and Governor-General Canning admitted that the matter "caused him more anxiety than he had felt since the fall of Delhi." The trouble was brought to a head when the Rev. James Long, a missionary imbued with the true spirit of Christianity, translated *Nil Darpan* ("Mirror of Indigo," a Bengali Drama by a Calcutta citizen, Dinabandhu Mitra) into English and commented in the preface on the part played by the *Englishman* and the *Bengal Harkaru* in the controversy. Long was brought to trial on July 19, 1861 and sentenced to a month's imprisonment and a fine of Rs. 1,000/- which was immediately paid by an Indian citizen of Calcutta, for the sentence was regarded as a grave miscarriage of justice by all impartial observers, including the then Bishop of Calcutta, Dr. Cotton.

POLITICAL INSTITUTIONS IN CALCUTTA.

Public life in Calcutta was slowly growing all this time. During the troubled times of the Mutiny, Indians realised the necessity of an organisation to protect their interests, and the British Indian Association came into being. A similar necessity arose among Europeans in 1883, during the stormy days of the Ilbert Bill agitation when Lord Ripon sought to extend the jurisdiction of criminal courts over Europeans independently of the nationality or race of the presiding judge. Vested interests were thought to be in danger, with the result that the European and Anglo Indian Defence Association was established in 1883. The present title of European Association was adopted in 1912. In 1865, the Dalhousie Institute with its fine hall, and rather inelegant exterior, came into being.

OTHER INSTITUTIONS.

Of academic institutions, one of the most important is the Indian Museum opened to the public in 1875, affectionately described as "Jadu Ghar," "House of Wonders" and visited daily in thousands by simple villagers who come on a visit to Calcutta, just as of old they travelled the pilgrim way through the jungle to Kalighat. On January 1st, in the next year, was inaugurated the Zoological Garden at Alipur by His Majesty Edward VII, then on a visit to Calcutta as the Prince of Wales. This is almost equally popular with Bengal villagers on a visit to Calcutta. But they little imagine that the Calcutta institution with which they are more directly concerned than any other is the Calcutta Port Trust, which since 1870 has been looking after not only the export of their *pat* (jute) but also the import of their own *dhotis* or their wives' *saris*.

RECENT HISTORY.

To no other Viceroy is Calcutta so much indebted as to Lord Curzon, who has not only left abundant evidence of his love of Calcutta's history, but has given us the Victoria Memorial Hall, which, besides being the most magnificent building erected in India in modern times, is an epitome of British power in India. Yet it

was he and no other who, by the 'Partition of Bengal' assisted to create the situation, *viz.*, the annulment of the partition in 1911, which led to the dethronement of her foremost city as the Capital of India in favour of Delhi. The effect has happily proved contrary to prophecy: Calcutta is still "Queen of the Eastern Seas," and not by any means, to quote the words of Kipling in another connection, a "Withered beldame now, brooding on ancient fame." Her greatness is still present, and indeed omnipresent. But sufficient has been said to prove that Calcutta is a mosaic of many colours and shapes. She can justly point with pride to the solid contributions which her sons, whether by birth or by adoption, have made to the art, literature, science, politics, commerce and industry of the entire country, and to their leadership of thought.

CHAPTER II.

GENERAL DESCRIPTION OF CALCUTTA AND NECESSARY INFORMATION

GEOGRAPHY.

The second city in the British Empire is situated in Latitude $22^{\circ}33'47''$ North and Longitude $88^{\circ}23'34''$ East. It is built length-wise along the left bank of the Hoogly or Bhagirathi, the western arm of the Ganges, and is about 100 miles inland from where that river falls into the Bay of Bengal.

Calcutta stands, like all towns and villages in the Lower Gangetic delta, upon a rich silt. As to Calcutta's sub-soil, the following account taken from the Census* of India 1901, Vol. VII, pt. 13, may throw some light on it.

"From December, 1835, down to April, 1840, a series of bore operations was conducted under the Superintendence of a Committee of Naturalists. Of these operations the sinking of the Calcutta bore-hole in Fort William to a depth of four hundred and sixty feet below the mean sea-level was the most important. "The most interesting facts discovered by this great experiment were—

- (1) The complete absence of marine deposits throughout the depth of the bore-hole.
- (2) The existence, of a peat-bed at 30 to 35 feet, and again at 382 to 395 feet, below the surface.
- (3) The existence, in considerable quantities, of fine sand and pebbles like those of the sea-shore at 170 to 180 feet and at 320 to 325 feet, and again at 400 to 480 feet, below the surface. The greater part of these pebbles was derived from gneissic rocks.

"The most important conclusions suggested by these discoveries are thus stated by Blanford :—

There appears every reason for believing that the beds traversed from top to bottom of the bore-hole, had been deposited either by fresh water or in the neighbourhood of an estuary. At a depth of thirty feet below the surface, or about ten feet below mean tide-level, and

*Calcutta, town and suburbs : By A. K. Ray M.A., Asst. Census Officer.

again at three hundred and eighty-two feet, beds of peat with wood were found, and in both cases there can be but little doubt that the deposits proved the existence of ancient land surfaces.

"A peaty layer has been noticed at Canning Town on the Mutlah, thirty-five miles to the south east, and at Khulna, in Jessore, eighty miles east by north, always at such a depth below the present surface as to be some feet beneath the present mean tide-level. In many of the cases noticed, roots of the *sundri* were found in the peaty stratum. This tree grows a little above ordinary high-water mark in ground liable to flooding; so that in every instance of the roots occurring below the mean tide-level, there is conclusive evidence of depression. This evidence is confirmed by the occurrence of pebbles; for it is extremely improbable that coarse gravel should have been deposited in water eighty fathoms deep, and large fragments could not have been brought to their present position unless the streams, which now traverse the country, had a greater fall formerly, or unless, which is perhaps more probable, *rocky hills existed*, which have now been partly removed by denudation and covered up by alluvial deposits. The coarse gravel and sand, which form so considerable a proportion of the beds traversed, can scarcely be deltaic accumulations, and it is therefore probable that when they were formed, the present site of Calcutta was near the margin of the alluvial plain," "the bore-hole experiment carries us, therefore, behind legend and tradition to a time when the country was not the monotonous level from horizon to horizon which it has been from the dawn of history. We must picture a range of gneissic hills standing ruggedly out into the sea, and must imagine the subsequent depression of these, which extended the empire of the tides far inland. This depressed territory becomes in time filled over with loose sediment which sinks by the weight of its superincumbent layers until finally they are covered with the existing alluvial strata, which are indisputably of very recent geological origin, being all pleistocene (Post-tertiary)."*

In the opinion of Fergusson the tide was near Rajmahal about 4,000 years ago. Near the Sunderbans there was some sort of a "bar or barrier where the tides turned" and the area lying between this bar and the "apex of the delta" was a tidal swamp. The gradual

*Blanford and Medlicott—Manual of the Geology of India, Pt. 1, pp. 397—400.

upheaval and extension eastward of the Gangetic delta has been well described by Fergusson. About 4,000/5,000 years ago, the only part of this great alluvial plain which was habitable lay between the Sutlej and the Jumna. Right up to the Christian era cities could be built only at the foot of the Himalayas or on the southern hills. Gour could rise only after another thousand years or so, when the ooze had hardened sufficiently there.

About 3000 B.C. the Aryan immigrants could settle only in places which are now practically deserted, *e.g.* Thaneshwara and Samana. Then we find capitals growing on the elevated right bank of the Jumna—Delhi and Muttra. Later cities began to appear away from the hills—Hastinapur, Ayodya, Cannoge. In the years following the Christian era, Allahabad and Benares came into existence. Regarding the cities in Central portion of the Gangetic plain, Fergusson first mentions “in the south Rajagriha, and Gya close by.” Then came “Palibothra or Patna” in Alexander’s time. “On the north of the valley we first find Janakpore, in the Terai..... figuring as the capital of Bengal at the time when Ajodya was practically the capital of India; then Sravasti, Kapilavastu, and Kusinagara, all nestling under the hills close to the Terai.....

“It is not till six or ten centuries after our era that we find any more important cities eastward of Patna; but about the last named period, Gour, opposite Rajmahal, became the capital of Bengal, to be superseded by Dacca founded in 1604 and Moorshedabad, which only rose into importance in 1704.

“For a century after 1634, when our ships were permitted to enter the Ganges, Satgong or Hooghly was the port of Bengal, and continued to be so till superseded by Calcutta.”* (In 1757 Admiral Watson took up to Chandernagore his line-of-battle ships vessels of 60 and 64 guns. This would be impossible now).

In view of these and similar historical and geological evidences, Mr. A. K. Ray concluded in his report as follows :

“There are therefore good reasons to think :—

- (1) That in remote antiquity, gneissic hills stood out from the sea where Calcutta now is.

- (2) That at a later date probably during the tertiary period—these hills were depressed and a tidal swamp extended up to the foot of the Rajmahal hills.
- (3) That the Lower Gangetic plains below the Rajmahal hills began to be elevated by fluvial deposits about four or five thousand years ago.
- (4) That the extension of the delta was from north and west to south and east.
- (5) That near Calcutta, an elevation of the area has alternately been followed by a subsidence.
- (6) That in historical times the extreme south-eastern portion, including the districts of Khulna, Jessore, the Sunderbans, and Calcutta, was not fully formed in the seventh century of the Christian era, when East Bengal was sufficiently inhabited to form the nucleus of a kingdom.

Calcutta and a very large section of what comprises greater Calcutta lies along the left bank of the Hooghly or Bhagirathi. From one end to the other of this long line of garden houses, temples, mills, bathing ghats, burning ghats, dwelling houses, wharves, docks, etc., it would be nearly ten miles. The width of this line generally does not exceed two miles, but near Kidderpore in the south it extends to more than four miles in width. The river Bhagirathi, on which Calcutta stands, is less than half-a-mile in width near the Howrah bridge; but at other places this increases to nearly a mile. From north to south of Greater Calcutta on the left bank of the Bhagirathi we find Cossipore, Calcutta Proper, Maniktala, Entally (N. E.), Ballygunge (S. E.), Kidderpore (S. W.), Alipur, Bhabanipore, Kalighat (S. Central) and Tollygunge (S. E.) as important centres of population. On the right bank are Ichapur, Salkia, Howrah and Sibpore.

Calcutta is connected with the rest of India by several railways, steamer lines and roads. It has also an important future as an Air base.

RAILWAYS AND STEAMSHIP LINES.

Calcutta is connected with the rest of India by three great Railways and one extensive steamship line.

1. The East India Railway links Calcutta to Bombay and Lahore.
2. The Bengal Nagpur Railway connects Calcutta with Madras and Bombay.
3. The Eastern Bengal Railway goes to Darjeeling and Assam.
4. The British India Steam Navigation Company run services to Rangoon, Madras and other ports.

Besides these above there are several minor railway and steamship lines which run services to various places in West and East Bengal. Direct steamer services to foreign ports are also plentiful in Calcutta and, very often, the fares are cheaper from Calcutta than Bombay or Colombo. However the time factor does not enable Calcutta to cater to those who are in a hurry to go over to London, Paris or New York.

STATIONS.

Calcutta has two great stations. The Howrah station is on the right bank of the Bhagirathi and is the terminus of the East India and Bengal Nagpur Railways. A pontoon bridge of which more will be said elsewhere, joins this station to Calcutta. The other station is the Sealdah station, the terminus of the Eastern Bengal Railway. A great highway, the Harrison Road, stretches between these two Railway stations and an immense traffic passes along this road and the Howrah bridge every day.

BOOKING OFFICES.

The Bengal Nagpur Railway has the following important Booking offices :—

1. At the Howrah station (open day and night).
2. Esplanade Booking Office, Esplanade Mansions, Telephone, Calcutta, 361.
3. Messrs. Thomas Cook and Sons, 4, Dalhousie Square, Telephone, Calcutta, 5560.
4. Army and Navy stores, Chowringhee, Telephone, Calcutta, 444 (No luggage taken).
5. Bhowanipur Booking Office, 83, Ashutosh Mukherjee Road, Telephone, Calcutta South, 843.

The East India Railway Booking Offices are as follows :—

1. At the Howrah Station (open day and night).
2. No. 6, Fairlie Place, Telephone, Calcutta, 497.
3. No. A1, Kyd Street, Telephone, Calcutta, 2140.
4. Chowringhee Booking Office, Telephone, Calcutta, 498.
4, Chowringhee Place.
5. Army and Navy stores (No luggage taken) Chowringhee,
Telephone, Calcutta, 4313.
6. Burra Bazar Booking Office, 116/1, Harrison Road,
Telephone, Burra Bazar, 1124.
7. Shambazar Booking Office, 129/4/A, Cornwallis Street,
Telephone, Burra Bazar, 2400.
8. Beadon Street Booking Office, 7, Beadon Street, Tele-
phone, Burra Bazar, 1270.
9. Bhowanipur Booking Office, 83, Ashutosh Mukherjee
Road, Telephone, South 843.

The Eastern Bengal Railway has the following booking offices :—

1. At the Sealdah Station, (open day and night).
2. No. 3, Koilaghat Street, Telephone, Regent. 388.
3. Army and Navy Stores, Chowringhee, Telephone,
Calcutta, 4319.

All the City booking offices remain open between 9 a.m. and 6 p.m. on week days for booking passengers. Luggage and parcels close at 5 p.m., *i.e.* and hour earlier.

ROADS AND CONVEYANCE.

Calcutta has excellent roads, most of the important ones being tar-macadamised. Running North-South the important roads are, from the west; The Strand Road, The Chitpore Road, Bentinck Street, Chowringhee, Ashutosh Mukherjee Road, Russa Road, Central Avenue (Chittaranjan Avenue), Cornwallis Street, College Street, Wellington Street, Wellesley Street, Wood Street, Amherst Street, Circular Road, Old Ballygunge Road, and Gariahatta Road. Running East-West from the north are the Dum Dum Road, Paikpara Road, Grey Street, Ultadingi Road, Nimtolah Ghat Street, Beadon Street, Maniktolah Road, Maniktolah Street, Banstala Street,

Muktaram Babu Street, Cotton Street, Mechuabazar Street, Narikel Danga Road, Harrison Road, Canning Street, Kalutala Street, Mirzapur Street, Lalbazar Street, Bowbazar Street, Beliaghata Road, Esplanade, Dharamtolah Street, Corporation Street, Royd Street, Elliot Road, Park Street, Theatre Road, Lower Circular Road, Bhowanipur Road (Shambhunath Pandit Street), Elgin Road, Ekbalpore Road, Belvedere Road, Puddapukur Road, Momimpur Road, Alipur Lane, Judges Court Road, Hazra Road, Chetla Central Road, Sewer Road (also a branch in Dhakuria Road), Hide Road, Garagacha Road, Shahpur Road and Circular Road. Other important Roads are Sobhabazar Street, Shambazar Street, Belgachia Road in the North, a continuation North-Eastward of the Strand Road, The Red Road lying North-South on the Maidan and to the East of Fort William, Garden Reach Circular Road; Kidderpore Road in the South-West which sweeps from West Eastward in a gentle northerly curve and finally crosses the Maidan in a straight north-easterly direction; Tollygunge Road, Kalighat Road, Harish Mukherjee Road, entering Calcutta from the South-East and ending on the border of the Maidan going due North; Diamond Harbour Road, also entering the Maidan from the South, coming due north, etc., etc.

Calcutta is very well supplied with public and private conveyances. In this respect the Capital of Bengal is far ahead of any other Indian city and may well compare with some of the greatest of western cities. Buses pass along most of the important thoroughfares and the Calcutta Tramways Company's service also covers an extensive area. With the help of these public vehicles, one can go from any part of the city to any other very quickly and at a fairly low tariff. There is no uniform per mile rate and buses and tram cars do not charge the same fares; but, on the whole, the rates are in all cases very reasonable, and low. Numerous bus companies, some running only single buses and others large fleets, carry on a brisk business in Calcutta. Of these probably not more than two are European owned. The Indian bus companies provide a very quick and cheap service and are largely patronised by the public. The Calcutta Tramways Company attract passengers by their clean and fine looking cars and by allowing regular passengers facilities in the shape of cheap monthly tickets. Taxi cabs are abundant

in Calcutta. They are mostly of American and Italian make and are fine open touring cars. Fleets of Buick, Fiat, Oakland and Oldsmobile cars may be seen lined up on Chowringhee at all hours of the day, and their stalwart Sikh drivers are ever on the alert to pounce upon intending passengers. Taxi cabs can be hired according to the undermentioned rates and arrangements.

Per mile Annas Eight only. Minimum charge Annas Eight, Taxi-Meters register quarters of a mile only at Annas 2 per $\frac{1}{4}$ mile. Waiting charge annas two for every 4 minutes. Taxi cabs take up to three passengers at the above rate. Additional passengers are charged four annas each (children two annas) irrespective of distance. Two children under 10 are counted as one adult. This rule as well as the rule about waiting charges is open to non-enforcement by negotiation previous to hiring a cab. This previous negotiation however is important, as otherwise one may be put to much trouble by irate taxi-wallahas who grumble fairly audibly. Taxi-drivers do not expect any tips; but occasionally express expectancy by taking a long time to hand over one's change if it happens to be a few annas only.

The horse-drawn hackney carriage is a dying institution in Calcutta. The result is that the quality of the coaches and of the horses is fast deteriorating. These carriages are of three classes. The first class carriages are all open phaetons. The second class carriages are some of them phaetons and others closed *Bundgharries*. All third class carriages are closed. A good deal of fiction exists regarding hackney carriage fares in Calcutta; but one is not advised to go by such fare tables. A better way to escape annoyance is to bargain with a mild touch of bullying. The best way is to avoid the *Bundgharry* altogether and take a phaeton or, preferably, a taxi cab. The fares as fixed legally are as under:—

	1st Class.			2nd Class		
	Rs.	A.	P.	Rs.	A.	P.
First mile or part of a mile ...	0	8	0	0	6	0
Each additional mile or part thereof ..	0	6	0	0	4	0
For $\frac{1}{4}$ hour or less ...	0	8	0	0	6	0
For $\frac{1}{2}$ hour ...	1	0	0	0	12	0
For 1 hour ...	1	8	0	1	0	0
Every additional hour or part ...	0	12	0	0	8	0
For half day or 5 hours ...	4	0	0	2	8	0
Whole day or nine hours ...	7	0	0	4	8	0

HOTELS.

There are many excellent hotels in Calcutta, both under European and Indian management. Their rates, like all hotel rates anywhere, mean nothing unless one knows the time of the year, length of residence and the nature of accommodation required. During the winter months (November-March) the hotels are generally full up and one should, during these months, book in advance. The following are some of the best hotels in Calcutta :—

Grand Hotel, Chowringhee Road,	} European managed.
Great Eastern Hotel, Old Court House Street,	
Continental Hotel, Chowringhee Road,	
Spence's Hotel, 4, Wellesley Street,	
Calcutta Hotel, Mirzapore Street, Indian managed.	

RESTAURANTS.

In number Calcutta restaurants are not very remarkable; but they are mostly well managed, large and modern. On Chowringhee we have four restaurants of which Firpo's can easily claim the first place. The Grand Café, Café Royal and Bristol are also quite good. Messrs. Whiteaway Laidlaw's General Department Store also contain a first class restaurant which is strongly recommended. Peliti's in Old Court House Street is one of Calcutta's oldest and finest restaurants. It is patronised by the best class of people and provides excellent luncheons and dinners. The Bristol Grill in Royal Exchange place is an efficient little place on week days for the man who is in a hurry to get through his midday meal.

Among Indian and Chinese managed restaurants, the Imperial in Corporation Street (Samavaya Mansions), and the Canton, the Chang-Wah and the Nankin in Chinatown are well-known places. The Imperial runs a well fitted Billiard room, and the Chinese restaurants attract one by their novelty.

If one is not very particular about table linen, cutlery or crockery, and desires to sample real Indian dishes, one may pay a visit to the National Hotel near the crossing of Harrison Road and College Street. Here, as well as in the Chinese restaurants, one "full dish" means a quantity of food sufficient to feed three or four men.

SHOPS.

Shops in Calcutta may be found in every Street. Most of the big shops are however localised in and about Chowringhee (Park Street, Lindsay Street, Dharamtolah Street, Esplanade, Old Court House Street, etc.), College Street, Harrison Road, Bowbazar Street, Canning Street, Chitpur Road and Road Road. Those shops that are run on modern lines open on week days only from 9 a.m. to 6 p.m. (2 p.m. on Saturdays) and are closed on Sundays. The orthodox Indian business men keep their shops open at all hours and on all days. The modern stores have all fixed prices, and labelled and ticketed goods. The old style shopkeeper still believes in the spirit of bargain. But, everything said and done, the average man can still make his purchases at the orthodox fellow's shop at a low enough price to justify a little expenditure of time and breath. Among first class Department Stores in Calcutta may be named the following European managed concerns :—

Army and Navy Stores, Chowringhee.

Hall and Anderson, Chowringhee and Park Street.

Whiteaway Laidlaw, Chowringhee.

Francis Harrison Hathaway, Old Court House Street.

Other important places where purchases of every description can be effected very cheaply are—

Sir Stewart Hogg Market, Lindsay Street.

Laurel Novelty Company, Park Street.

Below are given the names of some of the best firms in different lines of trade and business—

BAGGAGE AND TOURING AGENTS.

Messrs. Thos. Cook & Son, Ltd., 4, Dalhousie Square, Telephone, Calcutta, 5560, Telegraphic Address: *Coupon*.

Messrs. The American Express Company, India, Government Place, East, Telephone, Calcutta, 3098, Telegraphic Address: *Amexco*.

Messrs. Cox & King's Shipping Agency, Ltd., Bankshall Street, Telephone, Calcutta, 4524, Telegraphic Address: *Coxship*.

Messrs. Grindlay & Co., Ltd., 6, Church Lane, Telephone, Calcutta 2460, Telegraphic Address: *Grindlays*.

BANKS.

- Allahabad Bank, Ltd., 6, Royal Exchange Place, Telephone, Calcutta 1147.
 The Americal Express Co., Inc., 14, Government Place, East, Telephone, Calcutta, 3097.
 Bengal Central Bank, 15, Hare Street, Telephone, Calcutta, 4157.
 Central Bank of India, 100, Clive Street, Telephone, Calcutta, 3222.
 Chartered Bank of India, Australia and China, Clive Street, Telephone, Calcutta 6945.
 Co-operative Hindustan Bank, Ltd., 12/2, Clive Row, Telephone, Calcutta, 1660.
 Hongkong and Shanghai Banking Corporation, 31, Dalhousie Square South, Telephone, Calcutta, 3205.
 Imperial Bank of India, 3, Strand Road, Telephone, Calcutta 4330.
 International Banking Corporation, 4, Clive Street, Telephone, Calcutta, 1487.
 Lloyd's Bank Ltd., 101/1, Clive Street, Telephone, Calcutta, 4520.
 Mercantile Bank of India Ltd., 104, Clive Street, Telephone, Calcutta
 The National Bank of India, Ltd., 104, Clive Street, Telephone, Calcutta, 5396.
 P. & O. Banking Corporation Ltd., 1, Fairlie Place, Telephone, Calcutta, 5100.
 Punjab National Bank, 135, Canning Street, Telephone, Calcutta, 919.
 Yokohama Specie Bank, Ltd., 102/1, Clive Street, Telephone, Calcutta, 5211.

CATERERS.

- Great Eastern Hotel, Ltd., Old Court House Street.
 Federico Peliti, Old Court House Street.
 Wallace's Restaurant, Lindsay Street.
 Firpo's, Chowringhee.

CHEMISTS.

- Bathgate & Co., Old Court House Street, Camac Street. Branch—Ballygunge.
 Smith, Stanistreet & Co., Dalhousie Square. Branch—Theatre Road, Dharamtolah Street and Great Eastern Hotel, Colonnade.
 Frank Ross & Co., 15/7, Chowringhee. Branch—2-A, Camac Street.
 R. Scott Thomson & Co., 15/1, Chowringhee. Branches—5, Chowringhee, 370, Upper Chitpur Road.

O. N. Mookerjee & Co., Sir Stewart Hogg Market, Lindsay Street.
 Sen Law & Co., 53-A, Wellesley Street.
 Standard Drug Stores, 45, Amherst Street.
 Whitehall Pharmacy, Ltd., 131, Lower Circular Road.
 Bose & Co., Cornwallis Street.
 B. K. Paul & Co., Bonfields Lane.

DAIRIES.

Edward Keventer, Ltd., 6/4, Lindsay Street. Branch---Ballygunge.

GRAMOPHONES: MUSICAL INSTRUMENTS.

T. E. Bevan & Co., Ltd., Old Court House Street.
 Carr Mahalanobis & Co., Chowringhee.
 Dwarkin & Son, Park Street.
 M. L. Shaw, Dharamtolah.
 Harold & Co., Dalhousie Square.

JEWELLERS.

B. Sarkar, Bowbazar.
 Thakorelal Hiralal, Lalbazar.
 Satramdas Dhalamal, Park Street.
 Hamilton & Co., Old Court House Street.

MOTOR CARS AND ACCESSORIES.

Allen Berry & Co., Park Street.
 G. Mackenzie & Co., Park Street.
 Great Indian Motor Works, Park Street.
 Branch---Dharamtolah.
 Ford Motors, Ltd., Chowringhee.
 French Motor Car Co., Lower Circular Road.
 Fiat Cars, Park Street.
 Stuart & Co., Park Street.
 Rolls Royce, Ltd., Park Street.

OPTICIANS.

Lawrence & Mayo, Ltd., 16, Old Court House Street.
 Presidency Pharmacy, 205, Cornwallis Street.
 Standard Optical, Co., 20, Chowringhee Road.
 Walter Bushnell Ltd., 21, Old Court House Street.

PHOTOGRAPHERS.

Bourne & Shepherd, Corporation Street.
 Photo Atelier, 10, Chowringhee Road.
 Edna Lorenz, Park Street.

PRINTERS.

The Art Press, 31, Central Avenue.
 Calcutta Phototype, Co., 1, Crooked Lane.
 Caledonian Printing Co., 3, Wellesley Place.
 Calcutta Fine Art Cottage, 76, Dharamtolah Street.

PROVISIONS.

Army & Navy Stores, Chowringhee.
 G. F. Kellner & Co., Ltd., Chowringhee Road.
 J. F. Madan, Dharamtolah Street. Branches—Park Street, Ballygunge and Tollygunge.

SPORTS GOODS.

Bombay Sports Depot, 13/C, Old Court House Street.
 Carr & Mahalanobis, 3, Chowringhee.
 Uberoi Ltd., 8, Esplanade East.

TAILORS AND OUTFITTERS.

Army & Navy Stores, Chowringhee.
 Ghulam Mahammad & Brothers, 18/6, Chowringhee Road. Branch—6/1, Lindsay Street.
 Phelps, 21, Old Court House Street.

WATCHES AND WATCH MAKERS.

Anglo-Swiss Watch Co., 6 & 7, Dalhousie Square East.

CALCUTTA'S HOSPITALS AND PHYSICIANS.

There is hardly any other city in the East where one could find so many highly qualified physicians and surgeons as in Calcutta. One can obtain the best medical help in Calcutta. The hospitals and specialised clinical institutions in Calcutta are also notable for their number and efficiency. Below are given the names of some of Calcutta's leading medical men :—

- Dr. L. M. Banerjee, M.S. (Cal.), F.R.C.S. (Eng.), Telephone Burra Bazar, 643.
- Dr. Siveapada Bhattacharjee, M.D., Telephone, Burra Bazar, 594.
- Dr. U. N. Brahmachari, M.A., M.D., Ph.D., Telephone, Burra Bazar, 594.
- Lt.-Col. E. Harold Brown, M.D., M.R.C.P., Telephone, Calcutta, 1070.
- Lt.-Col. Sir Frank P. Connor, D.S.O., I.M.S., Telephone, Calcutta, 1840.
- Dr. Kedarnath Das, M.D., C.I.E., Telephone, Burra Bazar, 1117.
- Lt.-Col. A. Denham White, M.B., B.S. (Lond.), F.R.C.S., I.M.S., Telephone, Regent, 621.
- Dr. Ekendranath Ghosh, M.D., Telephone, Burra Bazar, 2891.
- Lt.-Col. Green Armytage, V.D., M.D., F.R.C.P. (Lond.), I.M.S., Telephone, Calcutta, 903.
- Dr. N. J. Judah, M.B., Ch.B., F.R.C.S., Telephone, Calcutta, 3435.
- Kaviraj Gananath Sen, M.A., I.M.S., Telephone, Burra Bazar, 3043.
- Kaviraj Shyamadas Bachaspaty, Telephone, Burra Bazar, 126.
- Dr. Baman Das Mukherjee, Telephone, Calcutta, 2082.
- Dr. B. C. Roy, M.D., M.R.C.P., F.R.C.S., Telephone, Calcutta, 1516.
- Dr. Sir Nilratan Sircar, M.A., M.D., D.C.L., Telephone, Calcutta, 2235.

PRINCIPAL HOSPITALS.

- Ashtanga Ayurveda Vidyalaya, College and Hospital, 170, Raja Dinendra Street.
- Campbell Hospital for infectious diseases, Lower Circular Road.
- Carmichael Hospital for Tropical Diseases, Central Avenue.
- Carmichael Medical College Hospital, 1, Belgachia Road.
- Chittaranjan Hospital, 24, Gorachand Road, Entally.
- Mayo Hospital, Strand Road.
- Medical College Hospital, College Street.
- Presidency General Hospital, 244, Lower Circular Road.
- Shambhunath Pandit Hospital, 11, Elgin Road, Bhowanipur.

CHAPTER III.

CALCUTTA'S CLIMATE, SEASONS, AND POPULATION.

Calcutta has Three Seasons ; the Hot Season lasting from March till June, the Wet Season from June till October, and the Cold Season from October till March. Looking at these seasons with the eyes of the average "ditcher" the seasons may be reclassified into only two, Bearable and Unbearable. The Cold season is the former and the rest the latter. One of the worst forms of tropical heat may be experienced in this part of Bengal. There are probably few things on earth which can compete, as a method of torture, with the moist heat of Calcutta from May to August. The temperature is not so high, the average of the hot months being 83.3 degrees only; but the humidity makes life irksome. The temperature also goes up occasionally to over 100 degrees; but such "heat waves" fortunately do not last long, being swept out generally by a Nor'-Wester, *i.e.*, a dust and thunder storm. During the hot months Calcutta is somewhat cooled down towards evening by a regular sea-breeze. This is a redeeming feature of the hot season, and without this the inconvenience of staying in Calcutta during these months would be greatly intensified. The Cold Season however provides compensation to the inhabitants of Calcutta. The average temperature goes down to about 68 degrees and the humidity is low. The people of Calcutta try to, and do, make the most of these months. Sports, exhibitions, circuses, theatrical performances, dances, dinners, parties, excursions and general merriment occupy a prominent place on the city's programme. A great many championships in polo, tennis, cricket, field sports, etc., take place during these months. Many famous players come to play for these championships. All the hotels and restaurants provide fine programmes of dinners, dances and music, and Calcutta gives one a really good time in her best Season.

Rainfall in Calcutta is not uniform from year to year. Round an average of about 60 inches it varies between a maximum of 93 and a minimum of 43 inches. Most of this rainfall occurs from June to

October. Sometimes the downpour is so heavy as to flood a large part of the City, and on such occasions even boats are seen to cruise the streets of Calcutta.

POPULATION.

According to the census of 1921, Calcutta (with its suburbs) has a population of 1,327,547. How this compares with the population of the other great cities of India can be seen in the following table :—

Name of city.					Population.
Calcutta	...	...	...	...	1,327,547
Bombay	...	...	...	...	1,175,914
Madras	...	...	...	...	526,911
Hyderabad	...	...	...	...	404,187
Rangoon	...	...	...	...	341,962
Delhi	...	...	...	...	304,420
Lahore	...	...	...	...	281,781
Ahmedabad	...	...	...	...	274,007
Lucknow	...	...	...	...	240,566
Bangalore	...	...	...	...	237,496
Karachi	...	...	...	...	216,883
Cawnpore	...	...	...	...	216,436
Poona	...	...	...	...	214,796

DENSITY OF POPULATION.

Excluding the water area in Calcutta, the density of population works out on the average at 34 to the acre. The highest density noticed is 219 to the acre in Ward No. 6, or Jorasanko, as that part of the City is called. The lowest density is found in the extreme south of the city. It is something like 4 or 5 persons to the acre.

Density of population offers no difficult problem to Calcutta, as it does to Bombay, for example. Calcutta has enough space around it for expansion and it is spreading out fast, specially in the southern part.

GROWTH.

Towards the beginning of the 18th century Calcutta had a meagre population of about 10,000 only. By the middle of the century, this number had grown to about 100,000;—a very rapid

growth indeed! In 1831, the population of Calcutta was estimated at 229,305. By 1850, it had grown to over 400,000.

After 1850, we get some fairly certain records. The census of 1872 gave a return of 633,009 for Calcutta. Later figures are as follows :

Census.				Population.
1881	...	...	...	829,197
1891	...	...	...	932,440
1901	...	...	...	1,145,933
1911	...	...	...	1,272,279
1921	...	...	...	1,327,547

DAILY PASSENGERS.

A peculiar feature of Calcutta's population is the very large number of daily passengers who travel to Calcutta every day and go back to their homes outside the City every night by rail. The number of season ticket holders is nearly 300,000, which is over 20 per cent. of the City's stable population. This number has increased since the war, probably due to the rapid rise in the cost of living within the City area.

PROPORTION OF SEXES AND OF IMMIGRANTS AND NATIVES.

The Census of India points out two peculiarities of the population of Calcutta. One is the predominance of males over females. This is of course natural in view of the fact that Calcutta's population, whether Bengali or non-Bengali, is mostly immigrant, which is the second of the peculiarities mentioned above. Immigrants seldom bring their women folk with them to their place of temporary settlement (which may of course, with success in business, develop into a permanent residence).

In Calcutta there is even less than one female for every two males (470 : 1000). This may bear comparison with Rangoon's 445 females per 1000 males, Bombay's 525 per 1000 and Madras' 908 per 1000. The foreign-born portion of Calcutta's populations outnumber the permanent inhabitants by something like four to one. Probably not more than 250,000 of Calcutta's more than a million and quarter inhabitants are permanent residents in the true sense of the term.

If birth-place were a true index of permanency or otherwise of residence, the fact that only 335 per 1000 of Calcutta's dwellers were born in that city may have some significance. But in fact this figure urges one to draw a conclusion which hardly emphasises the peculiarity of the situation correctly.

VITAL STATISTICS.

The peculiar composition of the population makes it rather difficult to discuss Calcutta's vital statistics. The birth-rate is very low owing to the small proportion of women : while even many of those females, who reside in Calcutta, go back to their native homes to give birth to their children. The death-rate is also affected by this factor ; for people go home to die of diseases contracted in Calcutta. So that if Calcutta shows an unexpectedly low death rate, that does not make the City any the less a hotbed of disease and death. Naturally of course, deaths are more numerous in Calcutta than births ; for unattached males do not fail to die in Calcutta because they leave their wives behind in the remote villages of Bengal or Rajputana. The following figures may be studied with advantage to enable the situation to be clearly grasped.

		1911—20.		Per cent or population for 1911.	
		Births.	Deaths.	Births.	Deaths.
Calcutta	...	255,863	395,518	20.1	31.1
Tollygunge	...	3,940	3,126	21.4	17.0

Tollygunge is a suburb in which permanent dwellers out number the immigrant floating population.

HOUSING.

As in many other cities of the world, housing has presented one of the most difficult problems in Calcutta. In 1901 the average number of persons in a house in Calcutta was 7. In 1921 it was 5. This is some improvement no doubt, but when we come to learn what a "house" means we dare not declare the situation free of defects. The Census officer for Calcutta for 1921 was of opinion, that "the accommodation offered in Calcutta to its population is about 1.8 rooms per family. The average being so bad, and Calcutta being a city with

many wealthy persons dwelling in multiroom palaces, one can very well imagine the condition of the poor. In certain areas, as many as fifteen to twenty persons live in a single room containing air space hygienically insufficient even for one man. The Calcutta Improvement Trust is doing much to provide "lungs" for the city; but its constructions are hardly keeping pace with the demolitions that are being carried on everywhere. The City's "lungs" are improving; but the individual's lungs are still under-going torture and infection from foul air.

COMPOSITION OF THE POPULATION ACCORDING TO BIRTH PLACE.

The Census of India for 1921, in its Calcutta volumes, gives the following analysis of the birth place of Calcutta's 1,327,547 inhabitants :—

	Born in				
	Calcutta.	24 Parganas and Howrah Districts.	Other Partsof Bengal.	Other Provinces.	Out side India.
Inhabitants of					
Calcutta Proper ...	304,776	99,124	175,664	314,236	14,051
Suburbs in 24 Parganas ...	21,503	105,711	25,053	71,253	874
Howrah ...	3,922	90,534	20,969	79,023	853

Looking at the birth places of the population of Calcutta from a different point of view, we get the following figures :—

Born in					Number.
Bengal	...	...	...	...	847,257
Provinces and States adjacent to Bengal			...	...	269,431
Other Provinces and States in India			...	...	194,796
French Settlements	...	...	...	...	47
Portuguese Settlements		...	...	...	482
Other Asiatic Countries	...	...	...	...	6,347
Europe	...	...	...	...	8,513
Africa	...	...	...	...	101
America	...	...	...	...	263
Australasia	...	...	...	...	298
At Sea	...	...	...	...	12

Some Noteworthy Figures.

Born in					Number.
Bihar and Orissa	...	...	...	...	263,952
United Provinces	...	...	...	...	127,126
Central Provinces	...	...	...	...	8,082
Punjab	...	...	...	...	8,594
Madras	...	...	...	...	5,925
Bombay	...	...	...	...	5,577
Rajputana Agency	...	...	...	...	30,589
Afghanistan	...	...	...	...	719
China	...	...	...	...	3,226
Nepal	...	...	...	...	1,432
United Kingdom	...	...	...	...	7,843
France	...	...	...	...	188

RELIGION.

71 per cent. of the people of Calcutta are Hindus, 24½ per cent. Muhammadan and 3¼ per cent. Christian; while 1¼ per cent. are of other religions.

The proportion of Hindus has been on the increase since 1881. During the last 20 years there has been an increase of 14.7 per cent. in the total population. Hindus have, however, increased during the same period by 23.9 per cent. The proportion of Muhammadans has decreased by 3½ during the last ten years.

There is a tendency in the City for the population to break up into communal residential groups.

The following table shows the number of persons in Calcutta belonging to different religions :—

Religion.					Number
Hindu	...	...	...	...	940,841
Musalman	...	...	...	...	325,093
Christian	...	...	...	...	43,563
Brahmo	...	...	...	...	1,821
Sikh	...	...	...	...	1,485
Jain	...	...	...	...	5,678
Buddhist	...	...	...	...	3,515
Zoroastrian	...	...	...	...	641
Jew	...	...	...	...	1,820
Animist	...	...	...	...	1,465
Confucian	...	...	...	...	1,411
Unknown	...	...	...	...	117
Ariya	...	...	...	...	97

PROPORTION OF MARRIED AND UNMARRIED.

The following table gives us an idea of the civil condition of the people of Calcutta :—

Per 1,000 of each Sex.

AGE			MALE			FEMALE		
			Un-married	Married	Widowed	Un-married	Married	Widowed
0-5	Calcutta	...	988	12	0	990	9	1
	Bengal	...	994	6	0	987	12	1
5-10	Calcutta	...	974	25	1	962	36	2
	Bengal	...	956	42	2	891	103	6
10-15	Calcutta	...	891	107	2	615	368	17
	Bengal	...	868	126	6	494	481	25
15-20	Calcutta	...	737	259	6	134	809	60
	Bengal	...	665	321	14	97	846	57
20-40	Calcutta	...	224	750	26	46	752	202
	Bengal	...	151	800	49	17	802	181
40-60	Calcutta	...	37	887	76	23	423	554
	Bengal	...	23	853	124	7	422	571
60 and over	Calcutta	...	33	777	190	13	163	824
	Bengal	...	21	710	269	6	145	849
All Ages	Calcutta	...	369	596	55	302	475	223
	Bengal	...	490	462	48	336	473	191

These figures also show the true state of affairs in Calcutta and Bengal regarding child marriage and child widowhood of which so much capital is made by interested decriers of India.

NATIONALITY AND LANGUAGES.

We have already discussed the nationality of the inhabitants of Calcutta; but only in so far as the same can be judged by the birth place of the individuals. This of course is no sure index, for many foreigners are born in Calcutta and many inhabitants of Calcutta out-

side Calcutta. However we can look at this problem differently. The Census figures regarding the spoken language of Calcutta's inhabitants show that "an Indian language is the mother tongue of 97.2 per cent. of the people." Those speaking European languages are 2.35 per cent. and non-Indian Asiatic languages are spoken by 0.43 per cent.; 53.3 per cent. speak Bengali, 37.2 Hindi or Urdu and 4.6 Oriya. Rajasthani (including Marwari) is spoken by 7,655, Gujrati by 6,185, Telugu by 4,735, Punjabi by 3,091, Tamil by 2,071, Eastern Pharaia by 1,457, Kherwari by 1,266 and Kurukh by 1,016. "English is spoken by all but 490 of those who returned European languages."

EDUCATION.

The number of literate persons in Calcutta is 472,965. The number per mille literate of both sexes over 5 years of age is 385. But counted separately, males show a return of 465 literates per 1000 and females 214 per 1000. The superior position of the City in regard to education can be easily seen by comparing the above figures with those of the province of Bengal, which are as follows :—

Literate per 1000 of the age 5 and over of both sexes	...	104
" " " " " " " " " Males only	...	181
" " " " " " " " " Females only	...	21

A study of Calcutta's literacy by religion is interesting and as follows :—

Religion.	Total.	Literate.
Hindus	... 940,841	366,629
Muhammadans	... 325,093	62,857
Christians	... 43,680	33,365
Jains	... 5,678	3,849

English education has progressed greatly since 1901 as can be seen from the following figures :—

1901	Males	1,401	Females	506
1911	"	1,931	"	623
1921	"	2,619	"	798

INFIRMITIES.

In 1921, 2,324 persons were returned as 'infirm'. Of these 539 were Insane, 592 Deaf-mutes, 860 Blind and 333 Lepers. There were also 15 persons who were "doubly afflicted", that is suffered from more than one infirmity.

The Census Report says, "The proportion of the insane to the total population is, however, much less than it was in 1891 and 1901."

Lepers are most numerous among the Sheikhs (Musalmans) and the Indian Christians.

OCCUPATION.

The following table shows the occupation of Calcutta's dwellers and their dependents :—

Pasture and Agriculture	...	...	...	78,000
Industry	...	...	...	331,000
Transport	...	...	...	120,000
Trade	...	...	...	239,000
Public Force	...	...	...	11,000
Public Administration	...	...	...	40,000
Professions and Liberal Arts	...	...	...	74,000
Persons living on their Incomes	...	...	...	15,000
Domestic Service	...	...	...	110,000
Insufficiently described Occupation				276,000
Unproductive	...	...	...	31,000

CHAPTER IV.

PRINCIPAL EDUCATIONAL INSTITUTIONS.

CALCUTTA UNIVERSITY.

The University of Calcutta was founded, along with the Universities of Bombay and Madras, by an Act of Incorporation (Act No. 11 of 1857), passed on the 24th January, 1857. At its inception, the University adopted the form, government and regulations of London University. The function of the University was, as defined in the Preamble of this Act, to ascertain, by means of examination, the persons who have acquired proficiency in different branches of Literature, Science and Arts, and to reward them by academical degrees, as evidence of their respective attainments and marks of honour. The Body Politic and Corporate of the University then consisted of the Governor-General of India as Chancellor, one nominated Vice-Chancellor, the *ex-officio* Fellows (including, among others, the Lieutenant Governors of Bengal and the North Western Provinces) and Ordinary Fellows, nominated by the Chancellor, and appointed for life, the whole number of Fellows, exclusive of the Chancellor and the Vice-Chancellor, being not less than thirty. The Executive Government of the University was, as usual, vested in a Syndicate, consisting of the Vice-Chancellor and ten representatives of the Faculties, which were four in number, *viz.*, the Faculty of Arts, the Faculty of Law, the Faculty of Medicine, and the Faculty of Engineering.

The Registrar was the only officer appointed by the Senate for the administration of the office. In 1885, the post of a whole-time Assistant Registrar was created for helping the Registrar in office work.

The Degrees which the University was authorised to confer, after examination, comprised those of the Bachelor of Arts, Master of Arts, Bachelor of Law, Licentiate of Medicine, Doctor of Medicine and Master of Civil Engineering. As a matter of fact, the examinations which were held for the first time were the Entrance Examination, Bachelor of Arts Examination, Bachelor of Law Examination

and the 1st Examination of the Licentiate in Medicine and Surgery, with Honours Examination in Law. The list of Institutions, authorised to present candidates for the various examinations, included seven Government and six non-Government Colleges, located in Calcutta, Serampore, Hooghly, Krishnagar, Dacca and Berhampur, and seventy-nine schools in different provinces. There being no limits of territorial jurisdiction, it was open to the University and customary for it to admit to its examinations candidates from such distant places as Agra, Ajmere, Bareilly, Benares, Burma, Central Provinces, Ceylon, Delhi, Lahore, Nepal, and Rajputana.

Three years later following the creation of the University, a Supplementary Act (known as Act No. XLVII of 1860) was passed, by which the University was authorised to confer, in addition to those already provided for, such degrees and to grant such Diplomas or Licenses in respect of Degrees as the Body Corporate of the University might appoint by any bye-laws or regulations, subject to the approval of the Governor-General in Council.

As a result of this Act, the First Examination in Arts, the License in Law Examination and the License in Civil Engineering Examination were instituted in 1861,—the first to test the knowledge of students at an intermediate stage between the Entrance and the B.A. Examinations, and the second and the last to qualify persons for the legal and engineering professions without requiring them to undergo any Degree Examinations.

The want of a permanent habitation for the University had been long felt, and its work had, until 1873, been carried on in rented houses. In 1872, the Government of India came to its rescue and helped it with a building, constructed at a cost of Rs. 4,34,697 which was taken possession of by the University early in 1873. This building, which is known as the Senate House, not only formed the nucleus of the residential properties of the University, but also, for a good many years, housed its offices, meetings, and Convocation, and served the purposes of an Examination Hall. In later years, with the development of the University, an extension of building accommodation had, from time to time, to be made, with the result that the University Buildings now include several commodious structures, such as, the Darbhanga Library Building (for the University Library, Law College together with its Library, University Offices,

as also for examination purposes,—for which its top floor accommodates above 700 candidates); the Hardinge Hostel (for the residence of the students of the University Law College), the Asutosh Building (for Post-Graduate classes in Arts, Post-Graduate offices, the Lending Library and the Anthropological Museum), and two Science College Buildings—one on the Upper Circular Road and the other at Ballygunge (for Post-Graduate classes in Science, with concomitant Laboratories and Museums), the last-named buildings being the gift of that noble son of Bengal—Sir Taraknath Palit—whose princely donations have helped the University to establish the College of Science and Technology. Towards the construction of the Darbhanga Building, the University received substantial help from the Hon'ble Sir Rameswar Singh, Maharaja of Darbhanga, who contributed Rs. 2,50,000 for the purpose.

By an Act of 1875, the University was empowered to confer the Degree of Doctor in the Faculty of Law upon any person on the ground of his eminent position and attainments, without requiring him to undergo any examination; and the first Degree of D.L. was conferred, *honoris causa*, on His late Majesty the King-Emperor Edward VII (then H. R. H. the Prince of Wales), at a special Convocation held on the 3rd January, 1875, on the occasion of his visit to India. Since the amendment of this Act by an Additional Act in 1884 and the passing of Act No. VIII of 1904, the University has been given the privilege of conferring Honorary Degrees in other Faculties as well, which, under this new Act, include the Faculty of Science also; and among many distinguished persons who have since been the recipients of these distinctions from the University may be mentioned the names of scions of two Royal houses of Europe, *viz.*, H. R. H. George Frederick Earnest Albert, Prince of Wales, (now His Majesty the King-Emperor George V), H. I. R. H. the Crown Prince of the German Empire and of Prussia, and H. R. H. Edward Albert, the present Prince of Wales, on whom the University conferred, *honoris causa*, the Degree of Doctor in the Faculty of Law in 1906, 1911, and 1921, respectively, and those of many great men of different countries and nationalities, such as Dr. Monier Williams, Rev. K. M. Banerjee, Dr. Rajendralala Mitra, Sir Alfred Woodly Croft, Dr. Mahendralal Sircar, Sir Andrew Fraser, Sir Asutosh Mookerjee, Prof. Arthur Schuster, Sir Subhaiyar Subramaniya

Aiyar, Dr. R. K. Bhandarkar, Sir Pratulchandra Chatterjee, Sir Gooroo Das Banerjee, Rev. Father Eugene Lafont, Sir Herbert Hope Risley, Surgeon-General Gerald Bamford, Sir Thomas Henry Holland, Sir Praphullachandra Ray, Dr. G. Thibaut, Shams-ul-Ulama Syed Ali Bilgrami, Lt.-Col. Douglas Craven Phillott, Prof. P. Bruhl, Sir Jagadischandra Bose, Prof. Hermann Oldenberg, Dr. A. R. Forsyth, Sir Taraknath Palit, Dr. Paul Vinogradoff, Dr. Hermann Jacobi, Dr. William Henry Young, Sir Rashbehary Ghose, Dr. Rabindranath Tagore, Dr. H. H. Hayden, Dr. Sylvain Levi, Lord Reading, Lord Ronaldshay, Syed Ameer Ali, Prof. A. A. Macdonald, Prof. W. A. Craigie, Sir M. Visveswara, Sir Brajendranath Seal, Dr. R. P. Paranjpye, Dr. G. T. Walker, Sir John Herbert Marshall, Dr. R. Sama Sastri, Prof. S. K. Aiyengar, Prof. H. Stephen, Prof. C. E. Cullis, Rai Bahadur Dineschandra Sen, Prof. D. R. Bhandarkar, Prof. C. V. Raman, Prof. Abanindranath Tagore, Prof. W. Williams, Sir W. J. Pope and Sir William Ewart Greaves, whose eminent position and attainments in the realms of Literature, Arts, Science, Law, Medicine, and Engineering, have earned for them the Honorary Degrees of Ph.D., D.Litt., D.Sc., M.D. and D.L.

The Universities of the Punjab and Allahabad having been established in 1882 and 1887, respectively, the Calcutta University lost its hold upon the provinces falling with their territorial jurisdiction. Gradually, in later years, with the establishment of several other Universities, specially the Universities of Patna, Dacca, and Rangoon, which were founded in 1917, 1920, and 1921, respectively, and which once formed an integral part of this University, it has been bereft of its dominion in other provinces also. Although the Act of 1904 fixed for the Calcutta University, and that for the first time, its territorial jurisdiction as lying within the provinces of Bengal, Bihar, Orissa, Assam, and Burma, its present limit has since undergone certain changes, with the result that the University now holds sway only over Bengal (excluding the municipal area of the town of Dacca) and Assam, with fifty-four Colleges and about one thousand Schools within them.

An event, which apparently may appear trivial, but which has great value in the history of the University administration, happened in 1890, when, for the first time, a distinguished son of the soil, Sir (then the Hon'ble Mr. Justice) Gooroo Dass Banerjee was appointed

Vice-Chancellor. Since 1906 many other distinguished sons of Bengal have adorned this office, and the University, in its present condition, owes much to every one of them, specially to that great man, Sir Asutosh Mookerjee, who is rightly called the "Father of Calcutta University."

As a result of investigations by a Commission, appointed in January, 1902, at the instance of the Governor-General of India in Council, an Act (Act No. VIII of 1904), amending the Law relating to the Universities in British India was passed by the Governor-General of India in Council, and it came into force on the 1st September, 1904. This Act was designed to give effect to the recommendations of the Commission for the re-organisation of the government of the Indian Universities, their assumption of teaching functions, the maintenance of lecture rooms, libraries, museums, laboratories and workshops for the promotion of teaching and research, the institution of University Professorships, Readerships, and Lectureships, the introduction of a modified system of examination under different Faculties, as also the system of awarding Doctorate Degrees on theses, and more effective supervision by the Universities over the Colleges, as well as more exacting conditions of affiliation. The scope and function of the Universities thus underwent vital changes, they being transformed from mere examining Bodies to teaching and research organisations. The Calcutta University is still governed mainly by the constitution framed under this Act. The Senate, comprising the (official) Chancellor, the (nominated) Vice-Chancellor, the *ex-officio* Fellows and the Ordinary Fellows, constitute the Body Corporate of the University, the number of Ordinary Fellows being raised to a maximum of one hundred, each appointed for five years, out of which ten are elected by Registered Graduates and ten by the Faculties, and the rest nominated by the Chancellor. The elective principle, though on a limited basis, was thus introduced into the University for the first time by this Act of 1904. There is also provision, in the Act for the appointment of Honorary Fellows, which consist of the Benefactors of the University (including, at present, the Maharaja of Darbhanga, the Maharajah of Cossimbazar, and Rai Bahadur Gyanchandra Ghosh) and Ordinary Fellows who held office at the commencement of the Act but ceased to do so later on, (including, among others, Sir Jagadischandra

Bose, Kt., C.S.I., C.I.E., M.A., D.Sc., F.R.S.). An important change has also been made in respect of the Faculties by the creation of a new Faculty devoted to Science and by the admission of qualified persons, who are not Fellows, to take part in the working of the University as Added Members of the Faculties. The Syndicate is now composed of 15 elected representatives of the Faculties and the Senate, with the Director of Public Instruction, Bengal, as an *ex-officio* Member, and the Vice-Chancellor as Chairman. The power of recommending Examiners and text-books for the various Examinations has been vested in a new Body called the Board of Studies, appointed by the Faculties from among their own members. Matters relating to the finances of the University have, as before, been left to the Board of Accounts. The work in connection with the management of the University Library is entrusted to the Library General Committee and the Library Executive Committee. Among other changes, contemplated by the New Act, the provisions for the appointment of University Professors and Lecturers for Post-Graduate Teaching and that of University Readers for the benefit of research students deserve special mention, inasmuch as mainly by this arrangement the University has been given the status of a teaching and research organisation. The question of affiliation of Colleges and supervision of residence of College students together with the question of recognition of schools has been left to the control of the University, with the reservation of final sanction in respect of affiliation of Colleges by Government. The changes introduced in the examinations and curricula of studies for them are also worthy to be mentioned. The Entrance Examination of former times has been replaced by the Matriculation Examination, and the age-limit for the Examination has subsequently been lowered to 15 years; the F.A., B.A. and M.A. Examinations have each been bifurcated into two, namely, the I.A. and I.Sc., the B.A. and B.Sc. (with Honours) and the M.A. and M.Sc. Examinations; two examinations in teaching, *viz.*, the L.T. and the B.T. Examinations have been introduced; the L.M.S. Examination and the next higher Examination for the M.B. Degree—which was also provided for at a later stage—were combined together into the M.B. Examination in three parts—the Preliminary Scientific, 1st and Final M.B. Examinations (which have recently undergone another change by the institution of five

examinations for the M.B. Degree, *viz.*, the Preliminary Scientific, First, Second, Third and Final M.B. Examinations); and, in place of the License in, and Master of, Civil Engineering Examinations, the Intermediate Examination in Engineering and the Bachelor of Examination in Engineering have been introduced. Provision has been made for the substitution of a part of the M.A. and M.Sc. Examinations by research work, as also for the admission of persons to the Doctorate Degrees under different Faculties on the merits of theses submitted by them. Among other new Examinations prescribed under the new Act, or introduced subsequently, may be mentioned the B.Com. Examination, D.P.H. Examination, Examination in the Diploma in Spoken English, Master of Law Examination, Master of Surgery Examination and Master of Obstetrics Examination. The Examination for the License in Law was discontinued in 1875, and the Bachelor of Law Examination, which was at first bifurcated into two parts, has subsequently been divided into three parts, *viz.*, the Preliminary, the Intermediate and the Final Examinations in Law, and the eligibility of graduates under different Faculties for admission to the Examination has been recognised. In the syllabuses of studies, Vernacular has been given a prominent place and Indian Vernaculars have been prescribed for the M.A. Examination. The subjects of Elementary Mechanics, Elementary Hygiene, Commercial Geography, and Business Method and Correspondence have been included in the curriculum of studies for the Matriculation Examination, Civics, Commercial Geography and Commercial Arithmetic and Elements of Book-keeping for the I.A. Examination, Linguistics for the B.A. Examination, and Anthropology and Experimental Psychology for the Bachelor and Master Degree Examinations. Recently, a change in the Regulations for the Matriculation Examination has been proposed by the University, making provision for the teaching in Vernacular, and for vocational and technical education and abolishing the age-limit for the Examination. The scheme is now under the consideration of Government.

This change in the system of Examinations, affording greater scope to the students in the choice of courses and subjects, has gone a great way towards spreading higher education in the country, as will be evident from the following comparative table showing the

number of candidates registered for the General Examinations in 1904 and 1926 and the percentage of passes in each :—

Examination.	No. of candidates in		Percentage of passes in	
	1904.	1926	1904	1926
Entrance ...	7,421		37.44	
or				
Matriculation ...		16,406		56.6
F.A. ...	3,953		34.32	
or				
I.A. ...		4,462		35.6
I.Sc. ...		4,393		53.7
Bachelor of Arts ...	2,231	2,978	14.83	55.0
Bachelor of Science ...	14	1,188	35.7	57.5
Bachelor of Commerce ...	Nil.	134		32.08
L.T. ...	Nil.	25		72.
B.T. ...	Nil.	67		83.5
B.L. ...	697	1,636	42.3	46.2
L.M.S. & M.B. ...	123	836	45.5	40.93
B.E. ...	23	64	25.9	91.25
M.A. ...	196	425	27.5	62.3
M.Sc. ...		151		47.01

Under the provision of the Act of 1904, a whole-time Registrar and an Inspector of Colleges (to carry on the work of inspecting Colleges) are periodically appointed. Subsequently, in 1917, the appointment of a Controller of Examinations for the conduct of Examinations was provided and, since then, a separate Office has been maintained for the purpose and the Registrar has been entrusted only with work of an academic nature.

Like the Assistant Registrar in the Office of the Registrar, there is a whole-time Assistant Controller of Examinations to assist the Controller in his office work.

A notable change in the constitution of the University was made in 1921, when, by an Act (Act VII of 1921) amending the law relating to the University, the office of the Chancellor was transferred to the Executive Head of the Government of Bengal, who, from 1906 to 1917, had been the Rector of the University.

In the field of research, for which the Act of 1904 made ampler provision, the institution of the "Premchand Roychand Research

Scholarship " with the princely donation of two lakhs of Rupees, received, in 1866, from Mr. Premchand Roychand of Bombay laid the true foundation of such work. Since then, several other endowments have been made from time to time by philanthropists and public bodies with a view to stimulating research work in the different branches of knowledge, among which the following may be specially mentioned :—

Tagore Professorship (in Law), Maharajah of Durbhanga Scholarship (in Medicine); Sir Rashbehary Ghose Professorships and Scholarships (in Arts or Science); Sir Taraknath Palit Professorships and Scholarships (in Science); Khaira Professorships (in Fine Arts and Science); University Research Scholarships (for work under University Professors). Many prizes and medals, too numerous to be mentioned here, have also been endowed by public-spirited individuals.

In 1908, the Jubilee of the University was celebrated and the Jubilee Research Prize was founded on the occasion with a sum of Rs. 30,000/-, set apart from the Reserve Fund of the University, for the promotion of research by its Graduates.

In 1909, the New Regulations making provision for Post-Graduate Teaching by the University came into operation; while in 1917, the system of centralisation of Post-Graduate studies in Calcutta was introduced in the name of, and under the control of, the University. Accordingly, a Post-Graduate Department has been set up, its government being vested in two Councils for Arts and Science consisting of all Post-Graduate teachers, with a President and an Executive Committee for each body, the Proceedings of the Councils being subject to confirmation by the Senate. Provision has been made, separately for this Department, for the constitution of Boards of Higher Studies in different subjects for recommending Examiners and text-books for Post-Graduate Examinations. Questions of appointments, tenure, pay, terms and conditions of service of the teaching staff are considered by a Body called the Appointments Board, which has been constituted for the purpose, its decision being subject to confirmation by the Senate. For administrative work, there is provision for the appointment of a wholetime Secretary for each Department of Arts and Science.

The Post-Graduate Department has undertaken instruction and examination in the following subjects, as well as the teaching of Pali, Arabic, Persian, Experimental Psychology, Commerce and Anthropology (in the Department of Arts and Zoology), Physiology (in the Department of Science), up to the B.A. and B.Sc. Standards respectively :—

Arts Department.—English, Sanskrit, Pali, Comparative Philology, Arabic, Persian, Indian Vernaculars, Philosophy, Experimental Psychology, History, Ancient Indian History, Economics, Commerce, Pure Mathematics and Anthropology.

Science Department.—Applied Mathematics, Physics, Chemistry, Botany, Physiology, Geology, Zoology, Applied Chemistry.

Arrangements have also been made for the teaching of Tibetan, Chinese and Japanese under the auspices of this Department.

Ever since the undertaking of teaching work by the University and the development of education in the country, the number of students reading for various branches of studies has gone up, and the Department has now 942 students reading for the M.A. Degree and 327 students reading for the M.Sc. Degree. The number of teachers (including University Professors and holders of endowed Chairs) is 201 and 59, in the Departments of Arts and Science respectively.

The establishment of the University Science College has a great history behind it—in fact, it is the history of human sacrifice at the altar of Learning. In 1912, Sir (then Mr.) Taraknath Palit made over to the University lands, buildings and money to the value of fifteen lakhs of rupees in aid of the foundation of a University College of Science and Technology. Later, on the 8th August, 1913, Sir (then Dr.) Rashbehary Ghose came forward with an offer of ten lakhs of rupees in furtherance of the same object, and, again, on the 22nd December, 1919, he placed at the disposal of the University a further sum of eleven lakhs and forty-three thousands of rupees to be applied exclusively for purposes of technological instruction and research. The money, lands and buildings, thus made available by the princely gifts of those two great men of Bengal, brought into existence the University College of Science. Out of the income derivable from the Palit endowment, two Chairs are maintained, one of which is designated the Palit Professor of

Chemistry and the other, the Palit Professor of Physics. The princely gift of Sir Rashbehary Ghose was applied towards the foundation of six chairs for Applied Mathematics, Physics, Chemistry, Botany, Applied Chemistry and Applied Physics, respectively. In 1921, the University was endowed with a fund of Rs. 5,50,000/- from the estate of the late Kumar Guruprasad Singh of Khaira and, out of the annual income of that fund, five University Professorships are maintained. One of these Professorships is named the Bageswari Professorship of Indian Fine Arts, and the other four Chairs are named the Guruprasad Singh Professorships of Phonetics, Physics, Chemistry and Agriculture, respectively.

By the last-named Professorship Agricultural education has been given a place in the curriculum of studies of this University.

The control of the above three endowments is vested in three different Bodies styled the Governing Body of the Sir Taraknath Palit Trusts, Board of Management of the Sir Rashbehary Ghose Endowments, and Board of Management of the Khaira Fund, respectively, subject to confirmation of their Proceedings by the Syndicate or the Senate, as the case may be.

The government of the entire Science College is entrusted to a Body called the Governing Body of the University College of Science, the proceedings of which are subject to confirmation by the Senate.

In addition to the endowed chairs mentioned above, the following Professorships, established for the promotion of research and higher studies are also maintained by the University :—

Tagore Law Professorship (founded in 1868); Minto Professorship of Economics (founded in 1908); George V Professorship of Mental and Moral Science (founded in 1911-12); Hardinge Professorship of Higher Mathematics (founded in 1911-12); Carmichael Professorship of Ancient Indian History and Culture (founded in 1912); Professorship of Comparative Philosophy (founded in 1913); University Professorship of English (founded in 1914); University Professorship of Botany (founded in 1918); University Professorship of International Law (founded in 1920); and University Professorship of Zoology (founded in 1920).

The Tagore Law Professorship is maintained out of the endowment made by Mr. Prasannakumar Tagore, formerly a Fellow of the

University; the George V. Professorship of Mental and Moral Science and the Hardinge Professorship of Higher Mathematics were established in commemoration of the visit of their Imperial Majesties King Emperor George V. and Queen Empress Mary; and the Minto Professorship of Economics was founded on the occasion of the Jubilee of the University. A Government grant of Rs. 37,000 is received for the maintenance of three of these Chairs. The other Chairs are being maintained out of University funds.

To perpetuate the memory of the late Sir Asutosh Mookerjee, the Senate has also lately sanctioned the creation of three other chairs, namely, the Asutosh Professorships of Sanskrit, Ancient and Mediaeval Indian History and Islamic Studies, respectively.

The Post-Graduate Department with its brilliant staff of Professors and Lecturers has produced many original works of research in the domain of arts and science and many of them have earned for themselves an international reputation. The names of the following, among many others, who have done signal service to the cause of higher education by their research work, are worthy to be mentioned in this connection:—Sir Praphullachandra Ray, Prof. C. V. Raman, F.R.S., Prof. Hemendrakumar Sen, Prof. P. Brühl, Prof. Jnanendranath Mukherjee, Prof. Debendramohan Bose, Prof. Sisirkumar Mitra, Prof. Nikhilranjan Sen, Prof. Sunitikumar Chatterjee, Dr. Niranjanprasad Chakravarti, Rai Bahadur Dr. Dineschandra Sen, Dr. Girindrasekhar Bose, Dr. Kalidas Nag, Rai Bahadur L. K. Ananthakrishna Iyer, Dr. Prabodhchandra Bagchi, Dr. Harischandra Sinha, Mr. Benoykumar Sarkar, Dr. Haridas Bagchi, and Prof. Syamadas Mukherjee.

It is interesting to mention, in this connection, that Sir Praphullachandra Ray is now rendering gratuitous service to the University, and the salary payable to him under the terms of the Palit Trusts is, at his desire, being utilised for the furtherance of the Department of Chemistry (both general and Applied).

The Regulations of the University provide for the appointment of University Readers to deliver lectures, mainly for the benefit of Graduates engaged in research work. A series of public lectures on special subjects are also arranged by the University for the promotion of original investigation and research. These lectures are known as University Extension Lectures.

Among other organisations for the advancement of learning, the Ghose Travelling Fellowships, the Ramtanu Lahiri Research Fellowship and the Sreegopal Basu-Mallik Fellowship have the greatest importance.

The Ghose Travelling Fellowships were founded in 1921 for the purpose of helping scholars to investigate educational methods abroad or to undertake research in any special branch of learning—the cost being met out of an endowment of two and a half lakhs of rupees made by Sir Rashbehary Ghose.

The Ramtanu Lahiri Research Fellowship was established in 1913 for investigation of the History of the Bengali Language and Literature from ancient times and for the delivery of a course of public lectures on the subject.

The Sreegopal Basu-Mallik Fellowship was originally established for the purpose of giving tutorial assistance to students of Sanskrit generally and of Vedanta Philosophy in particular. The scheme was modified in 1925, and the Fellow is accordingly now required to deliver a course of lectures on Vedanta Philosophy, dealing specially with the place occupied by Vedanta in the philosophical system of the civilised world and with its merits as compared with Western schools of thought.

Like the above Fellowships, there are three important Lectureships, *viz.*, the Stephanos Nirmalendu Ghosh Lectureship, the Kamala Lectureship and the Adharchandra Mukherjee Lectureship, established under the auspices of the University, which aim at the diffusion of higher thought and knowledge among the public.

The Stephanos Nirmalendu Ghosh Lectureship was founded in 1919, and maintained out of the income of an endowment of one lakh of rupees made over to the University by Rai G. C. Ghosh Bahadur, for the institution, in memory of his son, of a course of lectures on Comparative Religion once in every three years.

With a view to establishing the Kamala Lectureship in memory of his eldest daughter, Sir Asutosh Mookerjee placed at the disposal of the University in 1924, Government Securities for Rupees Forty Thousand for the institution of a course of Lectures, either in Bengali or English, on some aspects of Indian Life and Thought from a comparative standpoint. Dr. Annie Besant and the Right Hon'ble Mr. Srinivasa Sastri have already acted as Kamala

Lecturers in 1924 and 1925 respectively; and Mrs. Sarojini Naidu, and M. M. Dr. Ganganath Jha have been invited to participate in the work in future.

The Adharchandra Mukherjee Lectureship has been instituted with an endowment of Rs. 9,000/- made by Mr. Adharchandra Mukherjee, M.A., B.L., Member of the Senate, for delivery of a course of two Lectures annually by a distinguished Scholar on a selected subject connected with Letters or Science for the promotion of Post-Graduate Teaching.

In addition to these, there are three other Lectureships, established for the promotion of higher studies in Hindi and Oriya. The Hindi Lectureship has been founded out of an endowment of Rs. 15,000 made by Mr. G. D. Birla, and the Oriya Lectureships have their origin in two gifts made by Maharaja Sir Biramitrodaya Singh Deo of Sonapur, one of the last lectureships being established out of his endowment of Rs. 33,000 in memory of Sir Asutosh Mookerjee.

There is also provision for State and Private Scholarships, under the auspices of this University, for study outside India. The State Scholarships, tenable in England, originally founded by the Government of India, were provincialised in 1921, when the Bengal Government established two such scholarships of £300 a year each with the usual war bonus for the purpose of general study tenable for three years in the United Kingdom, to be awarded every other year to the best Hindu and Mahomedan candidates from the Universities of Bengal. The Guruprasanna Ghosh Scholarship and the Sir Taraknath Palit Scholarship are the two most important private scholarships, which are maintained out of the income of the endowments made by Mr. Guruprasanna Ghosh and Sir Taraknath Palit. The Guruprasanna Ghosh Scholarship aims at the promotion of real learning amongst young men who must be pure natives of Bengal, preferably Hindus, so that they may become specialists in some subject of Arts or Science, or increase their knowledge of Agriculture and of the Industries of Europe and America, or the East, the object of the Founder being to afford opportunities to the sons of artisans and mechanics, following such industry in India, to specialise in their arts. Three scholarships, of the annual value of Rs. 1,000 each, if tenable in Japan, and Rs. 2,000, if tenable in

Europe or America, for three years are maintained out of this endowment. The Sir Taraknath Palit Scholarship has been founded with a sum of Rs. 1,00,000, set apart out of the Trust estate of Sir Taraknath Palit, for maintaining a scholarship for advanced students in Science to carry on research or investigation abroad.

For the purpose of awarding scholarships, prizes and medals on the results of its various examinations, the University maintains 150 endowments, most of which have been made by outsiders and outside bodies.

The question of the establishment of a School of Mining has been engaging the attention of the University for a long time. It is, however, in contemplation by the University to establish it at Ikhra, for which purpose Mr. Prankrishna Chatterjee has made over to the University his School at Ikhra, with buildings and 100 bighas of land, and Rs. 10,000 in cash for the equipment of a laboratory, together with an annual grant of Rs. 1,800.

The importance of Libraries, Laboratories and Museums in the field of research and higher studies cannot be overestimated, and the University is not lacking in making due provision for them. There is an Anthropological Museum under the University which provides opportunities for research and study in Anthropology. The departments of Physics, Chemistry, Botany, Zoology, Geology, and Physiology in the Science College and Presidency College, now all possess complete laboratories. The University Library which was founded in 1869 with a donation of Rs. 5,000 from Mr. Joykissen Mukherjee of Uttarpara, and which has, through the munificence of the Maharaja of Darbhanga, been ultimately provided with its own location, has lately developed into a great institution. It now contains more than 100,000 volumes, which include works, besides those in English Literature and of the chief authorities on Indian Antiquities, almost complete sets of the Sanskrit, Pali, Arabic, Persian, Latin, French and German Classics, fairly good collections in Mathematics, Philosophy, Religion, History (including Biography, Geography and Travels), Philology and Anthropology, and an up-to-date collection of books (including Reports, Blue Books, etc.) in Economics, Politics and Sociology. It has also acquired most valuable sets of manuscripts in Bengali and Tibetan. Two separate sections of this library were founded with a large number of

books bequeathed to the University by Dr. Pischel, a great Oriental scholar, and Mrs. Dunn, in memory of her husband, Dr. Dunn.

With some exceptions in England and the United States, there are few Universities in the world which can boast of a longer and more varied list of publications than the University of Calcutta. The development of the Press Department has given the University ample scope for taking up the work in connection with important publications in the different branches of knowledge. Among its own serial publications may be mentioned the Journal of the Department of Arts, the Journal of the Department of Science, and the Calcutta Review, which are of great public interest. Several other periodical publications, such as the Chemical Journal, Mathematical Bulletin, Journal of Physics, Journal of Psychology, etc., are also printed at the University Press; they mainly embody results of research by the teachers and students of the Post-Graduate Department. The University has, up to date, brought out 272 publications, exclusive of text books in various languages.

Like the Post-Graduate studies, the University also affords facilities for legal studies on a sound basis. The University Law College was established for this purpose in July, 1909. It serves as a model College for the promotion of legal education of students for degrees in Law (both B.L. and M.L.). The management of the College is vested in a Governing Body, the Proceedings of which are subject to confirmation by the Syndicate. It has a whole-time Principal, a part-time Vice-Principal, and part-time Professors numbering 56. Beside the ordinary courses, it trains up students in Moot Courts. The present number of students on the rolls of the College is 2,300. The College has a good Library of 38,432 volumes. The Hardinge Hostel, which provides accommodation for 150 students, is attached to this College and is reserved for the use of Hindus.

The problem of the residence of students is admittedly one of great importance. The Hardinge Hostel partly removes the difficulty of Law students in this respect. There are three other messes attached to the Law College for the use of its students. For the accommodation of Post-Graduate students there are three messes licensed by the University. For the use of undergraduate students there are five undergraduate hostels attached to five private Colleges of Calcutta, and a Mahomedan

Hostel for Inter-Collegiate students, all six of which have been made over to the University by Government, after meeting the expenses of their construction. There are also 19 non-Collegiate Hostels (including 3 Hostels for students of the Depressed Classes). All these Hostels are under the direct supervision of the University. For the purpose of administering proper control over the residence of students of all descriptions a Committee of the Senate called the "Students' Residence Committee" is annually appointed, and its proceedings are laid before the Syndicate for confirmation.

The problem of residence and the problem of health of students go hand in hand. In order to consider the question of health of students, their physical education and the organisation of games and other forms of recreation, a Committee called the Students' Welfare Committee was appointed in 1925.

The introduction of compulsory Physical Education in Schools and Colleges is also engaging the attention of the University, and a scheme has been formulated for the purpose, which is under the consideration of Government.

Physical Education from a military point of view is served by the Calcutta University Training Corps. The Corps has been established for the military training of students and is now composed of them, as well as a few Professors. The present strength of the corps is 637. The authorised establishment is 670 officers and other ranks. Major E. F. Oaten, D.P.I., Bengal, is now the Commanding Officer, and of the total of the Indian Officers 15 are Hindus and one Mahomedan, nine being Professors of various Colleges and seven students. The Battalion is organised into four companies, each of four platoons, organised according to Colleges. So far a Headquarters Company, or Wing, has not been organised. Training is continuous except during the Long Vacation and the short period of Puja holidays. During the period of training, classes are held for N.C.O.'s, and promotion of N.C.O.'s is made on consideration of seniority coupled with efficiency. Parades are held on Wednesdays and Fridays in the afternoons, and on Sunday mornings. An annual Camp is held usually during the latter half of December. Members of the Corps fire an annual Musketry course at the Rifle Ranges at Belghurria. Officers are appointed either directly, or by promotion

from the Ranks—mostly through the latter channel—subject to the approval of the Officer Commanding and the Government of Bengal. A high standard of discipline is rigidly adhered to on parade. The Battalion takes part in public functions, such as Guards of Honour and the 1st of January Ceremonial Parade. Their services are generally utilised also on the occasion of the Annual Convocation of the University. It is a pleasing feature of the Corps that, notwithstanding their regular military duties, members are not found wanting in securing good academic degrees.

Besides caring for the interests of its internal students, the University is also mindful of the interests of its external students, and with that end in view it has established a Bureau, at the instance of the Government, under the name of the Students' Information Bureau, which is constituted mainly of representatives of the University and is managed by it—the Provincial Advisory Committee of former times having now disappeared. The function of the Bureau is to supply information, advice, and assistance to students wishing to pursue their education abroad, as also to supply foreign Universities with information regarding students which will enable them to make proper selection from among those applying for admission.

The resources of the University being very limited, financial assistance from Government is sought from time to time to meet necessary expenses of the various departments of the University. The grant under different heads with which Government helped the University in 1926-27 amounted to Rs. 7,11,128, against a total expenditure of Rs. 26,65,444 which the University had to bear.

In 1917, the Government of India appointed a Commission, with Sir Michael Sadler as its Chairman, for the examination of the present system of education, specially in reference to Calcutta University. The Commission recommended certain far reaching and fundamental changes. Two main recommendations of the Commission are the establishment of a Board of Secondary Education, and increased use of the elective principle in the constitution of the University.

“The recommendations of the Calcutta University Commission have to a great extent determined the lines on which were established in 1920 and the two following years the unitary teaching and residential Universities of Aligarh, Dacca, Delhi, Lucknow, Rangoon, and on which the University of Allahabad and Madras were reorganised

in 1921 and 1923 respectively." It may be hoped that in the near future these recommendations will be given effect to in reconstructing the University of Calcutta, for the benefit of which primarily the University Commission was appointed.

UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY.

The University College of Science and Technology at 92, Upper Circular Road, Calcutta, owes its origin to the munificence of the late Sir Tarak Nath Palit, who on the 15th of June and the 8th of October, 1912, executed two trust deeds in favour of the University of Calcutta whereby he made over to the University land and money of the aggregate value of Rs. 19 lakhs. The Founder stated that as his object was the Promotion and Diffusion of Scientific and Technical Education and the Cultivation and Advancement of Pure and Applied Science, amongst his countrymen through indigenous agencies, the Two Chairs which were to be founded by the University in this connection were to be filled by Indians. The management of the Trust was vested in a Governing Body consisting of the Vice-Chancellor of the Calcutta University, the Director of Public Instruction, Bengal, the Deans of the Faculties of Science and Engineering, four Members of the Senate, the two Professors and four Nominees of the Donor.

The University accepted the Trust and undertook to provide from its own funds a sum of Rs. 2½ lakhs for providing suitable Laboratory workshops and other facilities for teaching and research. The two Trusts of Sir Tarak Palit were followed by a gift of Rs. 10 lakhs by Sir Rash Behary Ghosh on the 8th of August, 1913. The Founder directed the establishment of Four Chairs for Chemistry, Physics, applied Mathematics and Botany with special reference to agriculture. The management of the Trust was also on similar lines. In December, 1919, Sir Rash Behary Ghosh followed up his gift by another of Rs. 12½ lakhs for technological studies, and Two Chairs, one for applied Chemistry and the other for applied Physics were founded in this connection. Two more Chairs were added to the Professoriate of the University by the munificence of Kumar Guru Prasad Sinha of Khaira who contributed 5 lakhs of rupees, the conditions with regard to which were accepted by the Senate by two resolutions, dated the 3rd of January, 1920 and 3rd June, 1921.

The Foundation Stone was laid by the late Sir Asutosh Mukherjee on the 27th of March, 1914, and the Post Graduate Classes were started in June, 1916, in the Departments of Physics, Chemistry (including Bio-Chemistry) applied Mathematics and Psycho-Physics (Exp. Psychology). The Departments of the Applied Chemistry and Applied Physics were started in 1920 and 1924 respectively. The total expenditure on the Building (including workshops) up to the end of the Session 1925-26 amounted to Rs. 4,72,115.

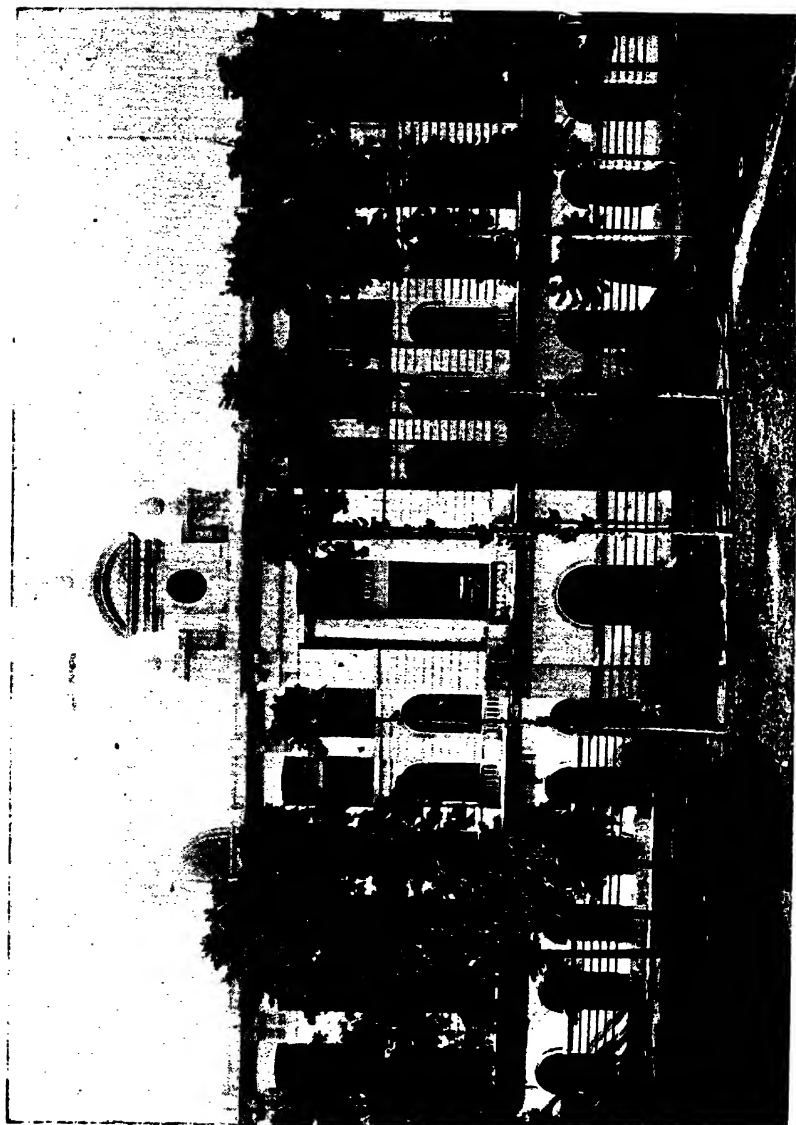
PRESIDENCY COLLEGE.

The Presidency College was formally established on the 15th of June, 1855, under orders from the Honourable the Court of Directors of the East India Company, though there is evidence that it had already started informally a year previously. The circumstances of its establishment connect it closely with the Hindu College or Mahavidyalaya, founded by a number of Hindu gentlemen with the aid of Sir Edward Hyde East, Chief Justice of the Supreme Court, and opened on the 20th of January, 1817. This origin connects the Presidency College also with the Hindu and Hare Schools, and more specially with the former, which continues the Junior Department of the Hindu College, as the Presidency College continues the Senior. The graduate scholarships attached to the Presidency College, of which particulars are given below, are a consequence of this connection, being derived from the Hindu College Fund.

Presidency College is thus in its beginnings carried back to the first efforts to promote liberal education in British India, and is associated with David Hare and Raja Ram Mohan Roy, who were inspirers of the movement which led to the foundation of the Hindu College.

From 1855 to 1910 the Presidency College was administered by the Education Department under the Director of Public Instruction, Bengal. In 1909 a Governing Body was constituted in accordance with Chapter XIX of the University Regulations, and met for the first time on Tuesday the 8th of March, 1910.

In December, 1914, His Excellency Lord Carmichael, first Governor of Bengal, became the official Visitor of the College, a title which His Excellency Sir Stanley Jackson has also consented to accept.



PRESIDENCY COLLEGE

Post-graduate teaching is now under the control of the University, but 30 members of the staff are also Post-graduate Lecturers.

The College is affiliated to the B.A. Honours stage in English, Philosophy, History, Political Philosophy and Political Economy, Sanskrit, Pali, Persian and Arabic; and in Vernacular Composition; and to the B.Sc. Honours stage in Mathematics, Physics, Chemistry, Physiology, Geology and Botany.

Scholarships and Prizes.

There are 75 part-free studentships attached to the College. Of these, 60 of the value of Rs. 7 per mensem are awarded to Under-graduate students, and 15 of the value of Rs. 8 per mensem to Post-graduate students.

A number of scholarships, paid out of the income of the Presidency College Graduate Scholarship Fund, are attached to the College. The fund originated with the subscriptions contributed in 1816 for the Hindu College; in 1863 it was amalgamated with three hitherto separate funds, which commemorated men eminent for their services to the cause of education. The scholarships are tenable by graduates of the Presidency College in Arts or Science for two years after taking the B.A. or B.Sc. degree, and have since 1909 been divided into two groups of five and six scholarships, respectively, awarded in alternate years :—

First Group.

			Per month.
			Rs.
1.	Burdwan scholarship	...	50
2.	Bird scholarship	...	40
3.	Gopimohan Tagore scholarship	...	30
4.	Hindu College Foundation scholarship	...	40
5.	Ditto	Ditto	25
6.	Ditto	Ditto	25

Second Group.

1.	Dwarkanath Tagore scholarship	...	50
2.	Ryan scholarship	...	40
3.	Hindu College Foundation scholarship	...	40
4.	Ditto	Ditto	30
5.	Ditto	Ditto	25

The Burdwan and Gopimohan Tagore scholarships commemorate two of the original subscribers to the Hindu College Fund. The Bird, Ryan and Dwarkanath Tagore scholarships were founded later in honour of Mr. W. Bird and Dr. Ryan (1845-46) and Babu Dwarkanath Tagore (1849).

Three free-studentships are provided out of the endowment of the late Maharaja Doorga Charan Law, C.I.E. These are at the disposal of the Founder's heir, subject to the conditions recognized as qualifying for admission to the College.

Two gold medals, called the Scindhia medals, and a prize, called the Gwalior prize, are awarded annually on the results of the Intermediate examination in Arts and Science. They were the gift of His Highness the Maharaja of Gwalior in 1870.

In addition to the above, there are many other scholarships and prizes, *e.g.*, the Nistarini Dasi scholarships and prizes; the Harish Chandra Kaviratna Sanskrit prize (to commemorate a former Professor), the Chandra Narayan and Kunja Bihari Bysak medals, the Astronomical Society's stipend, and the 'Sir Asutosh Mookerjee', 'Sir Asutosh Chaudhuri', and 'Cunningham' prizes.

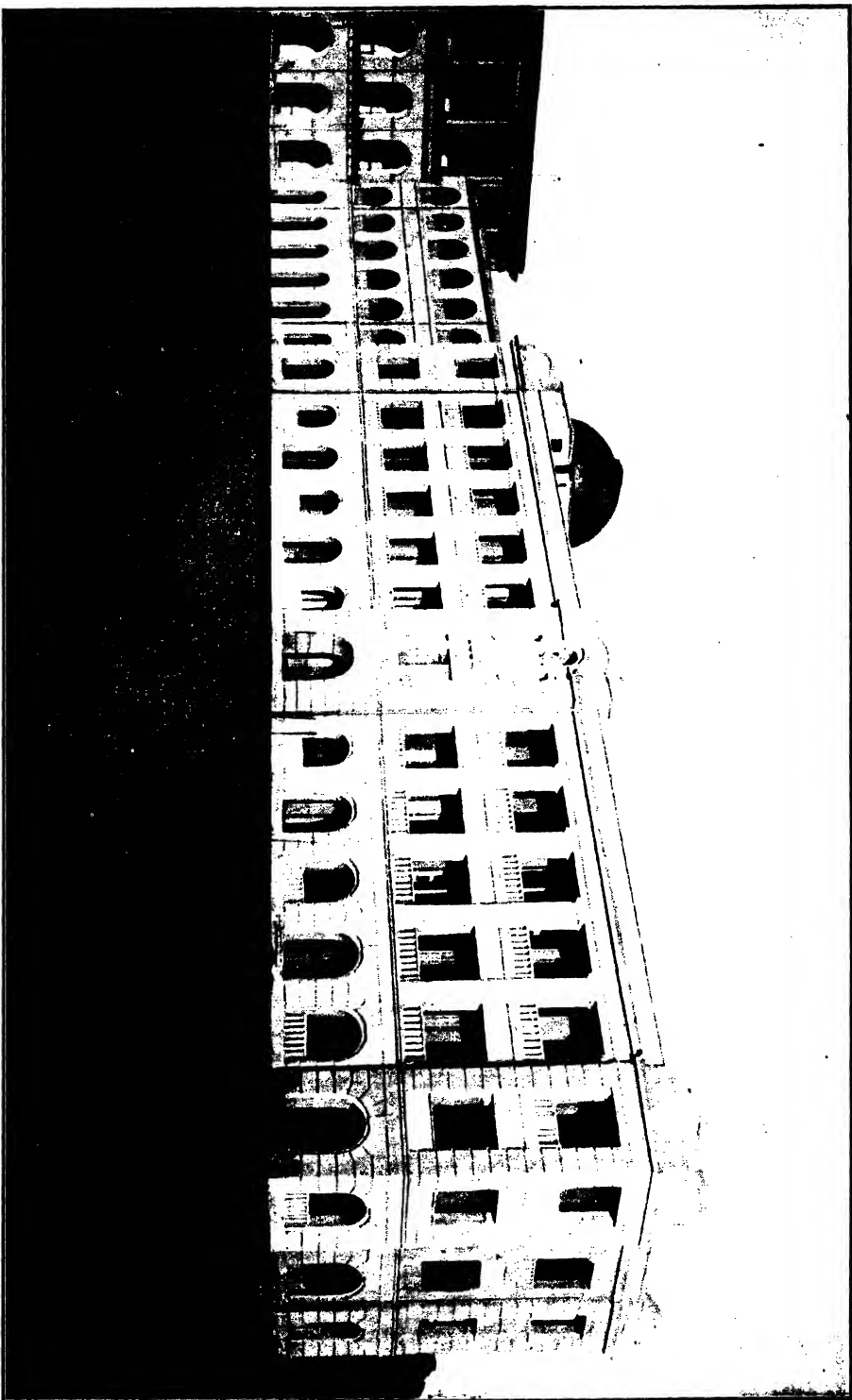
The Library.

The Presidency College Library contains about 45,000 volumes. The books in the Library are arranged on the principles of the Dewey system of classification, adapted to the special requirements of the Presidency College. Books and periodicals in Science and Mathematics are stored in the Peake Science Library, situated in the Baker Laboratory building.

The catalogue of the Library is divided into three parts: Part I contains books in Philosophy, Religion, Sociology and Philology; Part II, books on Science and Mathematics, including Science reference books and periodicals; Part III, books in Arts, Literature, Biography and History, and Reference books and periodicals.

Athletics.

The College Athletic Club provides for football, cricket, tennis, hockey and gymnastics; representatives usually enter for some of the events at the Annual Indian Sports Meeting at Marcus Square,



St. XAVIERS' COLLEGE (WITH OBSERVATORY).

and at the Inter-Collegiate Sports, and the College holds its own Sports Meeting as well. The ground is a part of the Calcutta Maidan, but a field adjacent to the College buildings is now also available. A patent stone tennis court, three grass courts and a cricket practice pitch have already been made in the College grounds.

The management of the club is largely in the hands of the students. The Principal, who is President of the club, nominates a Treasurer from among the members of the staff, who supervises all expenditure and guides the students in matters of policy. The Treasurer acts as Chairman of the Executive Committee. This consists of the Captains, Vice-Captains and Secretaries of the various games who are elected in the case of each particular game by those members of previous year's team who still remain members of the College; in the case of tennis, there being no representative team, these officials are elected by the Executive Committee. Colours are awarded for particular merit in each game.

Two cricket prizes are given each year, one for batting and one for bowling, provided a sufficiently high level of excellence is attained.

College Union.

All the 1200 students who read in the Presidency College belong to the College Union, which is intended for the promotion of social life in the College. A very well-edited Magazine is published under the auspices of the Union three times a year.

ST. XAVIER'S COLLEGE.

St. Xavier's College, which is under the direction of the Society of Jesus, was established in 1860 in an imposing building situated in Park Street. The stately portico, the hall and adjoining chapel are a century old and were once part of the "Sans Souci Theatre." The premises are among the largest of any private educational institution in Calcutta. The ample playgrounds are a special feature of St. Xavier's.

Besides its University Department, the College has a School Department averaging about 750 pupils. They are mostly of European descent. A good number of Indian boys, belonging to the

leading families in Bengal, are educated in this School. The curriculum of studies is based on the European Code and includes the Cambridge School Certificate as its final examination.

The University Department teaches up to the B.A. and B.Sc. degrees. Its students number about 800, the most cosmopolitan set of perhaps any Arts College in Bengal, for, besides a large number of Hindu and Mahomedan students, there are some 50 Anglo-Indians, as many Indian Christians, and a sprinkling of Jews, Parsees and Buddhists.

For the last 60 years St. Xavier's has enjoyed a high reputation for Science, due in particular to the efforts of Rev. Fr. Lafont S.J., who for nearly 40 years was a great pioneer of scientific education in Calcutta—a popular lecturer universally esteemed, always the first to acquaint the public with the latest new inventions. With the help of numerous friends, chiefly from among the Indian nobility, he succeeded in getting together a fine collection of Physical Science apparatus. Since his death in 1908, the laboratories have steadily expanded, and a variety of new apparatus, including a large wireless installation, has been added to the existing collection.

The Chemical department is also well equipped, specially for the more difficult branches of the Honours' course. The demand for admission into this department is always very great.

The College is fortunate in possessing an Astronomical Observatory, rich in instruments of great value. Its 9 inch refracting equatorial and its 10 inch reflector rank among the largest telescopes in India. The Observatory affords a unique opportunity to students of acquiring a taste for experimental Astronomy.

For nearly 50 years the late Fr. Francotte enjoyed a wide reputation for his meteorological work; but since his death in 1923, the Meteorological Observatory has been closed.

The various libraries in the College contain together nearly 27,000 books. The most remarkable is the Goethals' Indian Library with about 8,000 volumes, collected by the late Dr. P. Goethals, Archbishop of Calcutta, and bequeathed to the College. The books dating from the Portuguese and Dutch periods form a unique treasure, as also the numerous plates—coloured, photographic or engraved—on Archæology, Ethnology, Botany, Scenery, etc.

In the field of Sport St. Xavier's holds one of the foremost positions among educational institutions. To mention but one or two salient points. During the 25 years the Presidency Sports have been run, the Schools' Challenge Shield was won 11 times by the School Department. At the Inter-collegiate Sports almost every year the College Students carry off the Best Man's Cup or the trophy that goes to the Best College.

SCOTTISH CHURCHES COLLEGE.

The history of this College, which is situated in Cornwallis Square, may be traced back to 1830, when the General Assembly's Institution was founded by the Rev. Alexander Duff. In 1843, however, Dr. Duff separated from this College and established another College under the name of the Free Church of Scotland Institution. These two institutions were reincorporated on 1st June, 1908, as "The Scottish Churches College." It is one of the best institutions managed by missionaries and has done much for the spread of education among Indians. Its hostels are also well managed, and special attention is paid to athletics.

CARMICHAEL MEDICAL COLLEGE.

Historical Sketch.

This College, the first non-official recognised Medical College in India, came into existence in 1916, and affiliation to the University of Calcutta in the Preliminary Scientific M.B. standard was obtained in April of the same year. The Institution that developed into this College was, until the time of affiliation, known the Calcutta Medical School and the College of Physicians and Surgeons of Bengal. It had its origin in the year 1886 when some independent medical practitioners met and decided that as there was a great demand for medical education and as the Government Medical schools were unable either to cope with it or to supply a sufficient number of trained medical men for the people, a private medical school should be started to supplement the efforts of Government. The school, under the name of the Calcutta School of Medicine, continued in rented houses for seventeen years. The bulk of the present site was brought

in 1890 and the school was removed to Belgachia in 1903. The curriculum was modified in 1887 to that of the Government medical schools. The name was also changed to "the Calcutta Medical School." For clinical instruction the students used to attend the Mayo Hospital from the year 1888. The Albert Victor Hospital (a one-storied building) was formally opened with 40 beds in 1902. The upper storey was built and the new wards were opened in 1909, the total number of beds being thus increased to 100. The institution flourished, numerous students sought admission every year, and many trained men of the Hospital Assistant standard were passed out. The College of Physicians and Surgeons of Bengal, another private institution started in 1895, and aiming at medical education to the collegiate standard, was amalgamated with it in 1903. From July 1904 there was therefore the School with a four years' course and the College with a five years' course at Belgachia. The combined institution was now called the Calcutta Medical School and College of Physicians and Surgeons of Bengal and continued to do useful work till 1916. During these thirty years the object with which the institution was started was always kept in view and hundreds of trained medical men passed out who are doing useful work under Government, Municipalities, in the various industries, *viz.*, Jute, Tea, Shipping, etc., or as country-practitioners. This was rendered possible, mainly by the voluntary, ungrudging, and unpaid work done both in the School and in the Hospital by the independent medical profession.

In 1911, before the introduction of the Medical Registration Bill, the Government asked the private medical institutions in Calcutta to unite and form one good and efficient teaching institution with a view to help its recognition by the University or the Bengal Council of Medical Registration. Attempts at this union continued for nearly two years but failed. The Government of India then decided to render financial help to the parent institution at Belgachia with a view to its ultimate affiliation to the University of Calcutta. Negotiations were opened between the Government and the representatives of the institution in May, 1913. Ultimately, by the good offices of Colonel Edwards, who came to officiate for Colonel Harris as Inspector-General of Civil Hospitals, Bengal, a scheme was framed, the details of which were embodied in a letter dated 12th

October, 1913 from the President of the Belgachia Medical Institution to Colonel Edwards and were published later in the *Calcutta Gazette* of 20th April, 1915, soon after the scheme had been sanctioned by the Secretary of State. The main conditions were that the Government offered to give a capital grant of 5 lakhs provided the Committee raised 2½ lakhs from the public and a recurring grant of Rs. 50,000 provided they got Rs. 30,000 a year from the Calcutta Corporation and Rs. 10,000 annually from the University. The authorities had great difficulties in fulfilling the conditions of the Secretary of State and in obtaining affiliation to the University. However, at last these difficulties were overcome and, as has been mentioned above, the first affiliation to the University of Calcutta was obtained in April, 1916. For this consummation the authorities are greatly indebted to the Right Hon'ble Lord Carmichael, the late Sir Pardey Lukis, Director General, Indian Medical Service, and the Hon'ble Sir Sankaran Nair, Education Member of the Viceroy's Executive Council.

The College was formally opened on the 5th of July, 1916 by His Excellency Lord Carmichael, Governor of Bengal.

THE SCHOOL OF TROPICAL MEDICINE.

The Institute of Hygiene and the Carmichael Hospital for Tropical Diseases.

These three institutions form parts of one scheme for post-graduate instruction and research in tropical disease. The scheme was framed by Sir Leonard Rogers and it is to his energy and enthusiasm that the present organisation owes its existence.

The School, Institute and Hospital were built by funds which were raised by Sir Leonard from three chief sources.

	Original Contribution (in round figures)	Present recurring cost (in round figures)
I. Private Funds ...	... 8½ lacs	1 lac
II. Government of India ...	... 6 lacs.	Nil
III. Government of Bengal ...	... 4½ lacs	4½ lacs
IV. Research Fund Association ...	... 2 lacs	1½ lacs

The research side of the Institution has been in working for over six years, the teaching side for over five years.

The Teaching Side.

During the 1922-26 years medical men from all parts of India have been trained in Tropical Medicine to the number of 324 and in Public Health to the number of 49. In addition to these, large numbers of medical men have received special training in such diseases as Leprosy, Kala Azar, Hookworm disease, etc.

The chief object of the instruction at the School is to raise the standards of efficiency of the teachers and public health workers of India and to train research workers.

Every Local Government has been invited to become a profit sharer in the benefits which are available at the School, and the ideal which is aimed at is that a few of the picked medical men from each Province should receive higher post-graduate training at the School every year. In this way there will be a supply of good teachers and public health workers, and inevitably the standards of efficiency of the doctors of India will be improved. The result will be that the people of India will receive better medical treatment and more effective public health service.

The Research Side.

This aims at the discovery of better methods of treating and preventing the great disabling diseases of India; already many important advances have been made by the workers at the School.

Kala Azar is a fatal disease which kills thousands of people in Bengal, Assam and other parts of India. The Kala Azar research department has demonstrated the practicability of establishing out-patient dispensaries for the treatment of this disease at a very small cost. Such dispensaries are now established in many places in Bengal. A valuable means of diagnosis has been discovered, and recently the workers at the School have discovered that a kind of Sand-fly is probably the carrier of the disease. Owing to this discovery, research workers in various parts of the world are concentrating on the task of demonstrating the truth of this hypothesis. If, as we believe, it is finally shown that the Sand-fly is the carrier, the School

will have the credit of solving the last of the great problems of Tropical Medicine.

The work of the Leprosy department is well known throughout the world. The lines of treatment of this disease which have been worked out at the School are now adopted by most of the countries in which leprosy occurs. The whole outlook on life of the leper has been revolutionised. He is no longer the hopeless victim of an incurable disease and an outcast from society : he has a good prospect of recovery, and so comes forward for early treatment instead of concealing his disease until his condition is hopeless.

It is impossible to deal adequately with all the work which has been done at the School in a brief statement like this, but a few of the advances which have been made by the workers may be mentioned.

The Skin Diseases of India have been systematically studied for the first time and a text book on the subject is in preparation.

The causation of Epidemic Dropsy has been worked out with some degree of certainty, and it is likely that our work will be found to have a most important bearing on Beri Beri, which is either the same disease or at any rate closely related to epidemic dropsy. It is believed that the crux of the problem is the proper storage of rice.

A fever which had not hitherto been recognised in India has been discovered and its diagnosis has been placed on a sound footing. Since the publication of the first accounts of this disease it has been found to be common and widespread in the tropics.

The distribution of Hookworm Disease in India has been worked out, methods of prevention suitable for various localities have been published, and doctors are now in a position to form an accurate idea of the real importance of the disease in the places in which it occurs. Hitherto it was impossible to form any true estimate of the damage which is done by the disease, so that steps for its eradication could not be planned on a sound working basis.

Cholera infection appears to persist in many parts of India, but little was known of the conditions under which this occurred. One of our workers, in conjunction with the Chief Medical Officer of the Asansol Mining Settlement, has been at work on this problem and the results already obtained promise to be of immense value.

Many indigenous drugs have been analysed and tested and several have been discovered to be of real value. This work is of great importance as the practitioners of scientific medicine have often been accused of adopting an attitude of antagonism towards the use of valuable remedies of indigenous origin. The aim is to examine the drugs which are commonly believed to be of value and to sift the wheat from the chaff.

Valuable Malaria surveys have been carried out in several areas and measures have been recommended for controlling the disease in these places. As this work progresses it is expected that preventive measures will be devised which will be suitable for the various localities in which the disease occurs.

These are only a few of the lines of work which have been followed with success.

The following text books have been written by members of the staff, some of them in collaboration with other workers.

Major R. Knowles, I.M.S.	...	(1) Introduction to Medical Protozoology. (2) Lecture Notes in Medical Protozoology.
Major Knowles and Dr. Senior White	...	Malaria, its investigation and control.
Lt.-Col. A. D. Stewart, I.M.S. and Major Boyd, I.M.S.	...	Public Health Chemistry.
Dr. E. Muir	...	(1) Kala Azar, its diagnosis and treatment. (2) Handbook on Leprosy.
Dr. E. Muir and Dr. L. E. Napier	...	Kala Azar.
Dr. Muir and Sir Leonard Rogers	...	Leprosy.

The training of young Indian Research Workers is one of the important functions of the School. Many young medical men have had the opportunity of collaborating with first class experts and of obtaining an insight into the methods of research. Already some of them have won their spurs, and at least one discovery of first class importance has been made by a pupil of the School.

The Hospital and out Patient Departments.

The chief purpose of the hospital is to keep the research laboratories in touch with practical medicine and to supply suitable patients for the study of the diseases which are being investigated.

The School, thanks to the foresight of Sir Leonard Rogers, is very fortunately situated in this respect. Owing to the large population of Calcutta and to the fact that it is the "Charing Cross" of the most populous parts of India the supply of material is inexhaustible. From the humanitarian point of view the hospital also plays an important part. The facilities for diagnosis and treatment of obscure diseases are far greater than those existing in any other hospital in the East.

The Out-patients departments, which were opened with the object of obtaining material, have become so popular that an embarrassing number of patients come for diagnosis and treatment. The Pasteur Institute which was recently opened is already one of the largest in India, and large numbers of patients are saved the trouble and expense of a long journey to Shillong or Kasauli. Many also are now treated who would not have undertaken the journey to these distant centres.

The figures of attendance for the past year are :—

		Numbers treated.	Total Attendances.
Pasteur Institute ...	...	51,141	74,702
Skin Diseases Department ...	...	2,756	10,238
Leprosy Department ...	...	400	21,101
Kala Azar ...	...	1,168	7,754
General Tropical Diseases ...	...	6,196	12,074
X'Ray Department ...	...	264	2,258

This statement of the numbers of patients will give some idea of the work which is being done, but a visit to the departments will give a far more vivid impression than can be obtained by a bald statement of facts.

Through this School Sir Leonard Rogers has built for himself a monument of which any one might be proud.

THE BENGAL VETERINARY COLLEGE.

In 1883, a Committee was appointed by the Government of Bengal to consider the expediency of establishing a Veterinary College in Calcutta. The committee strongly urged the necessity of the establishment of a Veterinary College and Hospital near Calcutta,

but owing to the heavy expenditure involved by the proposals of the Committee, the Local Government was compelled at that time to defer further consideration on the subject. The question was again taken up in 1886 and a scheme was submitted by the Government of Bengal to the Government of India, in which definite proposals for the establishment of a Veterinary College in Bengal were made, but the introduction of the scheme was again deferred owing to the then existing circumstances of financial pressure. The subject was again taken into consideration in connection with the Technical college at Sibpore and a modified scheme involving a smaller outlay than had been originally proposed was submitted. This later scheme was being considered when it came to the notice of Mr. M. Finnucane, the then Director of Land Records and Agriculture, Bengal, that there had already been established at Sodepore, in the neighbourhood of Calcutta, a Pinjrapole where some 1,300 animals were daily fed and medical treatment was given to them. This institution was founded by some native Marwari gentlemen of Burra Bazaar, Calcutta, in 1885 and was supported by donations from the public, which already amounted to three lakhs of rupees. It was suggested that a Veterinary School might be established in the same place and worked in connection with the Pinjrapole. The Committee of the Pinjrapole accepted the proposal under certain conditions and undertook to provide a site, free of charge, for the Veterinary School, and they were willing to contribute Rs. 30,000 towards the contribution of the necessary buildings.

Dr. Kenneth McLeod, who was one of the members of the Cattle Plague Commission of 1871 and of the Committee appointed in 1883, had, with Mr. Finnacane, visited the locality on 25th February, 1890, and they were both of opinion that the offer of the Pinjrapole Committee might be accepted. Sir Dinshaw Maneckjee Petit of Bombay also offered to contribute Rs. 25,000 towards the cost of the Hospital. When matters reached this stage, the question of a more suitable site arose. Various sites were proposed, such as Entally, Sibpore and Bhagalpore. But afterwards, Belgachia, where Raja Shew Bux Bagla, President of the Managing Committee of the Calcutta Pinjrapole Society, owned a garden, was selected as the best site. In December 1892, orders were passed by Government to make a commencement of actual work in connection with the Institution.

The foundation stone was laid by Sir Charles Elliot, Lieutenant-Governor of Bengal, on the 20th April, 1892, and the institution was opened on the 10th January 1894.

Thus the Bengal Veterinary Institution, consisting of the Kenneth MacLeod Veterinary School and the Sir Dinshaw Maneckjee Petit Veterinary Hospital, was established at Belgachia by the Government of Bengal as a school for instruction of students of Veterinary Science and as a hospital for the treatment of sick and injured animals, mainly through the munificence of Raja Shew Bux Bougla of Calcutta, who, in memory of his late father Babu Ramdayal Bougla, made a gift of $3\frac{1}{4}$ bighas of land as a site for the school and further subscribed Rs. 30,000 towards its erection and Sir Dinshaw Maneckjee Petit who gave Rs. 25,000 towards the cost of the hospital, the Government of Bengal acquiring an additional five bighas two cottahs of land at a cost of Rs. 4,381, and supplying such other sums as were required to complete the school and the hospital.

The school is named after Dr. Kenneth MacLeod in recognition of the great interest he took, throughout his service in Veterinary matters, which is shown by the fact that on his departure from India, he endorsed to Government 5 per cent. Debentures amounting to Rs. 2,500 for the purposes of founding a scholarship called the "Shew Bux Bougla Scholarship" of the value of Rs. 10, now Rs. $11\frac{1}{8}$ a month, in recognition of that gentleman's liberality in connection with the establishment of the first Veterinary School and Hospital in Bengal.

In the year 1898, the institution was raised to the status of a College. The institution is managed by a Committee appointed being submitted to Government for information and orders, when necessary.

GOVERNMENT SCHOOL OF ARTS.

History of the School.

Some seventy years ago Art education was unknown in this country. Only a few stray artists remained in the villages as poor remnants of the glorious bye-gone days. In the year 1854 an Art

School was founded by a few wealthy citizens of Calcutta at 365, Upper Chitpore Road.

The school was afterwards removed to Colootola Street where now stands the Eye Infirmary of the Medical College Hospital. In 1859 this building was acquired by Government and the school was removed to a house near Sealdah, which being also taken up by Government, the school was removed to 163, Bowbazar Street. Here the Art School remained for twenty nine years from 1864 to 1893.

During the time of Lord Northbrook's administration Art education was seriously taken up by Government. A Committee was formed to consider the question of establishing a Picture Gallery, of taking the existing Art School under direct Government administration and amalgamating the two institutions into one. A number of modern paintings and plaster replicas of antique statuary were brought together as a small beginning for the Art Gallery chiefly for the benefit of Art Students. The Art Gallery was daily visited by a large number of people, and accommodation being found inadequate at the Bowbazar building, Government considered the question of providing the school with a suitable and permanent house in a suitable locality, and close proximity to the Indian Museum was decided upon. A suitable building was provided and the Art School was transferred to its present situation at 28, Chowringhee Road. To-day the school has on its rolls over 500 students who take one or other of two courses.

Drawing and Design Course.

The subjects in this course are: Drawing from Historical Examples, Still Life, and studies of Plant form, Animal studies, Landscape studies, in pen, wash, and colour, with an ultimate view to Design, as applied to books, illumination, labels, lettering, etc.

Life models are arranged for the advanced students of this class. There are regular periods of drawing and painting from Life in pen, wash, and colour, with a view to Figure Designing for illustrations of books. Posters, Advertisements, Wall Painting, etc. are also taught, and lectures on Human Anatomy are delivered at intervals.

Technical Course.

Students here undergo a period of practice in Lithography in order that they may be able to reproduce their designs on stone either in monochrome or colour.

OTHER COLLEGES AND SCHOOLS IN CALCUTTA.

(1) *Sanskrit College*, 1, College Square.—It is one of the earliest Government institutions founded in 1824, in the early days of the East India Company. Its object was to encourage the study of Sanskrit, but now an English Department up to the B.A. Standard has been added. It was connected with scholars like Isvar Chandra Vidyasagar, Mahesh Chandra Nyayaratna and Hara Prasad Sastri. A Veda class has been opened at the expense of the late Mohanta Maharaj of Tarakeswar. It contains many valuable MSS.

(2) *Bethune College*, 181, Cornwallis Street.—It was founded by the Hon'ble J. E. Drinkwater Bethune and Raja Daksinaranjan Mookerjee. Mr. Bethune, whose name the College bears, maintained it at his own cost up to 1851. The Marquis of Dalhousie also supported it from 1851-1856, when it was taken over by the Bengal Government. It is the foremost Girls' College in the Province.

(3) *Ripon College*, this was founded in 1880 and was then called the "Presidency School." Sir Surendra Nath Banerjee, who built up the College, acknowledges in his famous book of memoirs, *A Nation in Making*, his debt to many important persons, among whom we find Sir Henry Harrison and Sir Henry Cotton. Sir Surendra Nath ceased to take active part in the work of the College in 1913. The College prospered, in spite of this loss, under its famous Principal, the late Mr. Trivedi, who died in 1915. The present Principal is Mr. N. N. Ray. The College is one of the largest in Calcutta.

(4) *Vidyasagar College*, 39, Shanker Ghose Lane.—It was founded by the late Pandit Isvar Chandra Vidyasagar and was the first attempt by an Indian to run a College. It was affiliated to the University in 1872. Sir Surendra Nath Banerjee began his career as a Professor of this College. It prospered under the Principalship of Mr. Sarada Ranjan Ray. The present Principal is Professor J. R. Banerjee.

(5) *City College*, 102-1, Amherst Street.—It has grown out of the City School founded in 1879 and was formally opened by Lord Ripon in 1884. It is under the management of the "Brahmo Samaj Education Society." Its object is "to promote the cause of Education in the highest and widest sense, to make that Education—comprehending the mind, heart and body, and founded on the Theistic basis—conduce to the good of man and the glory of God." Its well-managed Gymnasium has in recent years turned out many good athletes.

(6) *Bangabasi College*, 25-1, Scott Lane.—It has also grown out of the Bangabasi School founded in 1886 by Principal G. C. Bose. The College Department was added next year. It possesses Physical, Chemical and Botanical Laboratories; and also publishes a magazine, the "Bangabasi College Magazine."

(7) *St. Paul's Cathedral Mission College*, 33-1, Amherst Street.—It was founded in 1865 under the name of the Cathedral Mission College at 22, Mirzapur Street. In 1914 it was affiliated to the B.A. standard and the name was changed to the present one.

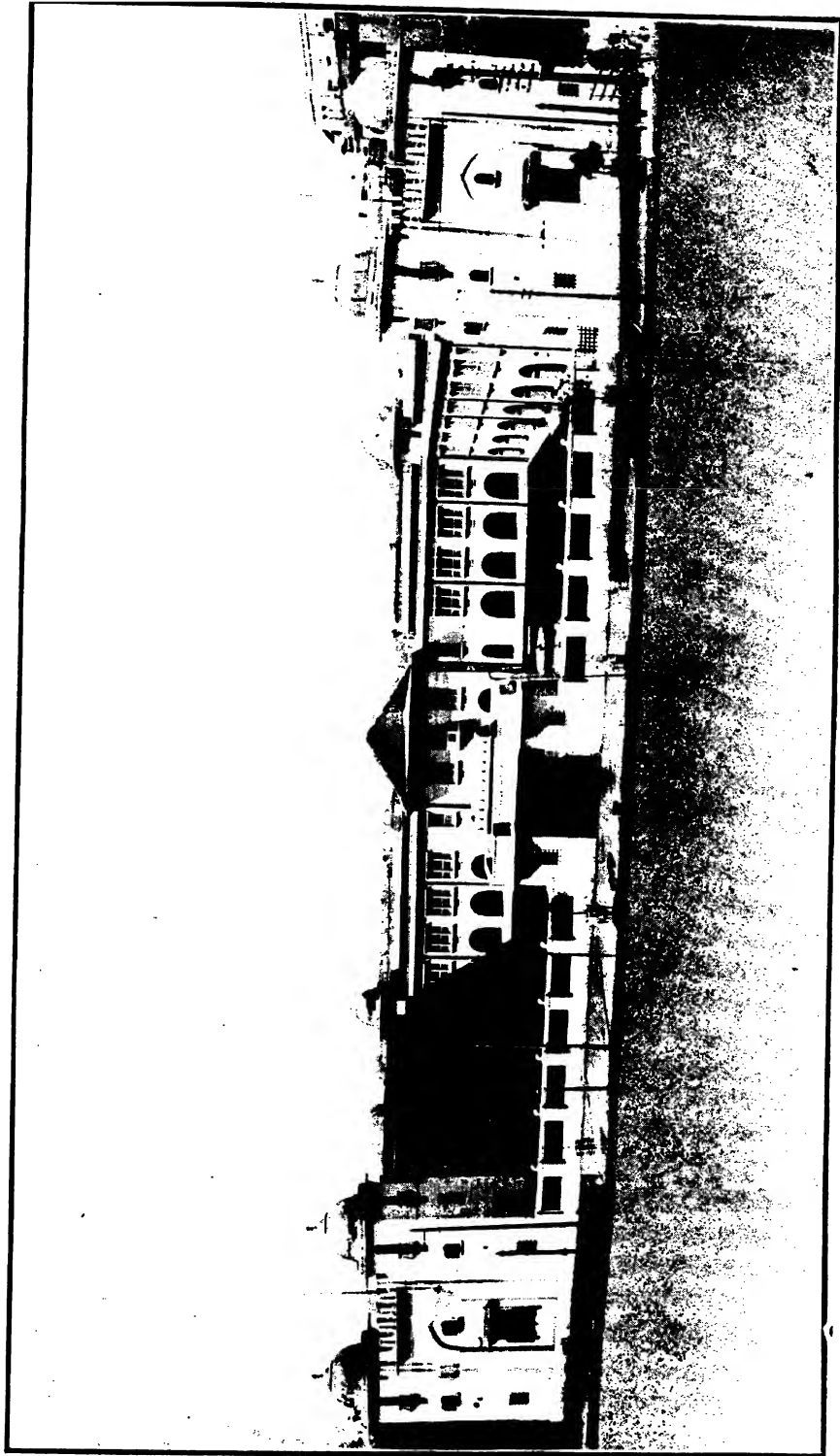
(8) *Diocesan College*, 47, Elgin Road.—It is one of the Colleges for the education of Indian girls. It has a competent staff of lady teachers, both Indian and European. The Principal is a Sister of the Clewer Order. It was affiliated to the University in 1907.

(9) *Asutosh College*, 147, Russa Road South.—It was originally started under the name of South Suburban College in 1916. After the death of Sir Asutosh Mookerjee, the name was changed to the present one. It is the only College on the Bhowanipur side.

(10) *David Hare Training College*, 25-3, Ballygunge Circular Road.—It was started by the Bengal Government in 1908 for the training of teachers. The course is of one year and includes both theoretical and practical teaching.

(11) *Narasinha Dutt College*, Howrah.—It was founded by Babu Suranjan Dutt in memory of his father in 1923. It is situated at No. 129, Belilios Road, Howrah.

(12) (a) *Islamia College*, 8, Wellesley Street.—This is a Government College, opened in 1926 for the benefit of Moslem students, and is affiliated up to the B.A. in Arts, and to the I.Sc. in Science. The building is one of the architectural sights of the City.



ISAMIA COLLEGE.

(12) *St. Joseph's College*, 69-70, Bow Bazar Street.—It was established about 82 years ago for the education of Anglo-Indian boys. It is under the management of Irish Christian Brothers, who devote themselves entirely to education.

(13) *Loreto House*, 7, Middleton Row.—It was founded under the direction of the Sisters of Loreto in 1842. It is connected with the University since 1889.

(14) *La Martinière College*, at the corner of Lower Circular Road and London Street.—It was founded by General C. Martin, who bequeathed Rs. 2,00,000 for the school, and a further sum of Rs. 1,50,000 for its permanent buildings. The schools—one for boys and the other for girls—were opened in 1836. The finances have recently been materially improved by the munificent donation of Rs. 11,00,000 from the late Sir Paul Chater.

(15) *St. Thomas' School*, Free School Street.—It was founded in 1789 for the education of indigent Christian boys. It has a Girls' Branch at Kidderpur.

(16) *Loreto Convent for Girls*, Convent Road, Entally, under the Loreto Sisters, has a free department.

(17) *Pratt Memorial School for Girls*, 168, Lower Circular Road,—is under the Clewer Sisters.

(18) *St. James' College for Boys*, 155, Lower Circular Road, was founded in 1867.

(19) *Armenian College*, Free School Street—is for the education of Armenian boys.

(20) *Bishop's Collegiate School*, 224, Lower Circular Road—was started at the request of Bishop Middleton in 1820. It is now amalgamated with St. Mary's High School under the name of Cathedral Mission High School.

(21) *Calcutta Madrasah*, 21, Wellesley Square—was originally founded by Warren Hastings. It is for the education of Moslem students.

(22) *Hare School* (opposite Presidency College, 87, College Street)—is associated with the name of David Hare.

(23) *Hindu School*, 1, College Square—is one of the best schools for the education of Indian boys.

(24) *Mitra Institution*—has its main school at Harrison Road, and a branch at Bhowanipur.

(25) *Keshub Academy*—bears the name of the Brahmo Leader, Keshub Chandra Sen.

(26) *City School*, Mirzapur Street—was founded in 1879.

(27) *South Suburban School*—is one of the oldest schools of Bhowanipur, being established in 1874.

(28) *Oriental Seminary*, 336, Upper Circular Road,—is also an old established school.

(29) *Medical College of Bengal*, 90—92, College Street.—It is the oldest Medical College in India. Its degree course covers a period of six years, at the end of which students may obtain the degree of M.B.

(30) *Bengal Engineering College*, Botanic Garden, P.O. Howrah.—It is the only Engineering College in Bengal. It was started in 1880 and is controlled by the Bengal Government. It has three departments—Civil Engineering, Mining, Mechanical and Electrical.

(31) *Calcutta Technical School*, 110, Corporation Street.—This teaches Mechanical and Electrical Engineering.

CHAPTER V.

MUSEUMS, LIBRARIES, SOCIETIES AND RESEARCH INSTITUTES

THE INDIAN MUSEUM.

Origin and early history.—The Indian Museum is an offspring of the Asiatic Society of Bengal and owes its birth to Dr. Nathaniel Wallich, a Danish Botanist, who, in 1814, vigorously advocated the necessity of establishing an institution of this kind. A start was made, and the Society began to collect Archæological, Ethnological, Geological and Zoological exhibits. In 1835 the attention of the Government of India was directed towards the development of the mineral resources of the country, and in 1840 they opened a Museum of Economic Geological collections in the Society's rooms. In 1858 the members of the Society urged upon the Government of India the necessity for the foundation of an Imperial Museum for housing the Society's collection. After prolonged correspondence which lasted till the middle of 1865, the Museum Act of 1866 was passed according legislative sanction to the transfer of the Society's collection to the new Museum building.

The Museum consists of five sections, *viz.*, the Archæological, the Art, the Geological, the Industrial and the Zoological Section.

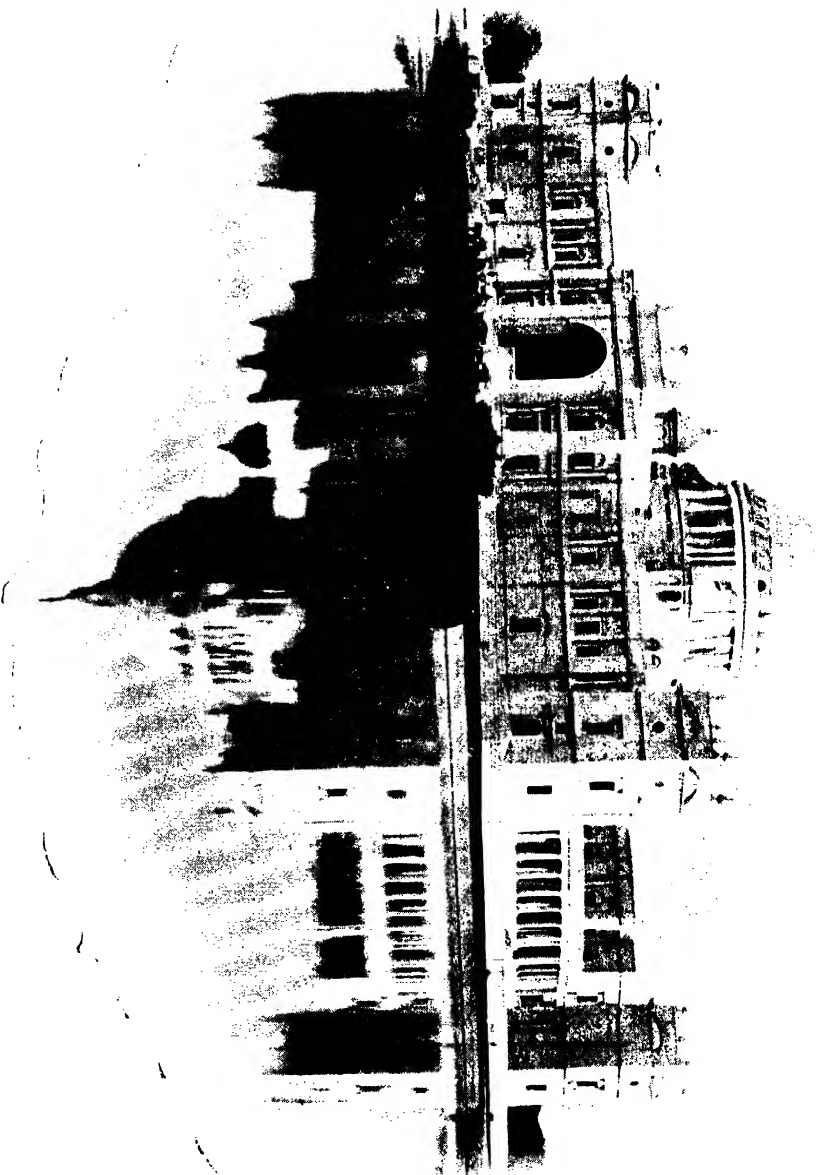
Archæological Section.—The Archæological collection is the richest in the East. The antiquities from Mohenjo Daro, in Sind, which are said to be about 5,000 years old, are the most remarkable in the collection of prehistoric antiquities exhibited in the New Hall. The other relics, dating from the 3rd century B. C. onward, consist of the precious contents of the relic box of the stupa of Piprawa, capitals of the monolithic columns of Asoka, the great carved railing of the stupa of Bharhut and a splendid collection of sculptures representing all phases of the history of Indian plastic Art. The collection of coins is unique in its variety. The Moslem gallery contains a large collection of Arabic and Persian inscriptions and carved stones illustrating Indo-Moslem decorative art. Visitors are also permitted to see two historic jewels, which formed part of the loot of Nadir Shah, when he invaded India and defeated the army of Muhammad Shah in February, 1739.

Art Section.—The Art Gallery is a pageant royal of oriental splendour. Among the noteworthy exhibits may be mentioned the large Tibetan Banner from Burma, the white muslin *Chapkan* very finely embroidered in gold, said to have been worn by the Emperor Aurangzeb, and given as a reward to one of his attendants after a victory on the battle field, the Bhavanagar House,—a specimen of Hindu style of wood carving, the State Council throne of King Thibaw from Burma, and a necklace and girdle made from human thigh bones worn by Lamas. The picture gallery contains a rich collection of pictures representing the various schools of Indian painting.

Geological Section.—The galleries of the Geological Section are divided into four groups, Invertebrate fossils, Minerals, Meteorites and Vertebrate fossils. The fossil gallery contains Indian fossils as well as foreign invertebrate and plant fossils (types). There are two petrified trees excavated from railway cuttings near Asansol which are of remarkable antiquity and are said to be about two hundred million years old. The Meteorite gallery contains an unique collection of Indian and foreign meteorites. The Siwalik Gallery contains the skulls and limb-bones of the now extinct ancestor of the Indian elephant and specimens of *Sivapithecus*—the missing link between man and ape.

Industrial Section.—The Industrial Section mainly consists of raw materials and finished products of the Indian vegetable world. Of the exhibits may be mentioned about 100 varieties of paddy as cultivated in Assam and Bengal, edible fruits, medicinal plants, food grains and cereals from different part of India. The process of manufacture of quinine from cinchona bark, and the opium plant with all the implements used for extracting opium in different provinces, are prominently exhibited. All kinds of fibres, showing the stages from the raw materials to the finished products, are on view. A small room is devoted to tea, exhibiting the machinery for drying, curing and manufacturing tea as sold in the market.

Zoological Section.—This section consists of the Invertebrate gallery, the Insect gallery, the Vertebrate galleries, a small Fish gallery, and the Amphibian, Reptilian and Bird galleries, the large Mammal gallery and the small Mammal gallery. In each of these galleries there are representative forms of almost all types of animals



VICTORIA MEMORIAL, CALCUTTA.

found within Indian limits and, in special cases, of peculiar animals not found in India.

VICTORIA MEMORIAL.

The Victoria Memorial takes its place as one of the great buildings of the modern world. Standing in its own grounds, west of the Cathedral, on the site of the old Presidency Jail, it dominates southern Calcutta. To Lord Curzon its conception is due, as a treasure house wherein are displayed a collection of pictures, statues, historical documents and other objects of interest illustrative of Indian history and especially of that of the Victorian era. The funds for its construction, amounting to seventy-six lakhs of rupees, were voluntarily subscribed by the Princes and Peoples of India. The architect was Sir William Emerson, and the work was entrusted to Messrs. Martin & Co., of Calcutta, who executed it under the supervision of Mr. V. J. Esch, C.V.O., the Superintendent Architect. His Imperial Majesty King George V., when Prince of Wales, laid the foundation-stone on the 4th January, 1906; and H. R. H. the Prince of Wales, on the 28th December 1921, formally opened the building. The design is chiefly Renaissance in character, though traces of Saracenic influence can be discerned. The exterior is of polished marble quarried at Makrana in the State of Jodhpur, where for many years the builders maintained an extensive plant and an army of workmen to provide the necessary material. The ornamental groups of statuary over the entrance porches and figures surrounding the dome were designed and executed in Italy.

The figure of Victory, standing 16 ft. high and weighing 3 tons, surmounts the dome, and revolves upon its own base, a sphere 2 ft. in diameter. From the ground level to the base of the figure of Victory is 182 ft. The dimensions of the hall itself at the corner towers are 339 ft. by 228 ft.

Entering by the northern door the visitor will find busts of King Edward VII. and of Queen Alexandra and statues of King George V. and of Queen Mary in the hall. The model of the Memorial is interesting as showing the completed design with the corner towers surmounted by the cupolas, which have yet to be

erected. The antique clock is a fine specimen by Whitehurst of Derby (F. R. S., 1713-1788).

To the right, in the Royal Gallery, is a collection of paintings representing events in the life of Queen Victoria, the gift of King Edward VII. Queen Victoria's piano and writing-desk occupy the centre of the room, while on the south wall hangs Verestchagin's masterpiece, depicting the State entry of King Edward VII. when Prince of Wales into Jaipur in 1876. This exhibit, which was presented by the Maharaja of Jaipur, should on no account be missed, as it is one of the finest works of art in Calcutta, if not in India.

On the opposite side of the entrance hall a collection of Persian books will be of interest to the antiquarian, and among the pictures on the walls will be found portraits of Holwell (by Reynolds), of Lord Clive (after Dance, R.A.), of the King of Oude and the Nawab of Arcot, both presented by H. M. the King Emperor, of Dwarka Nath Tagore (1795-1846, a notable of Bengal, whose enlightenment was in advance of his time), of Sir Henry Rawlinson (1810-1894), of Lord Lake (1744-1808), and of Maj.-Gen. Stringer Lawrence (by Reynolds), the bequest of the late Marquess Curzon of Kedleston, K. G. The statues in the corners are of Lord Wellesley and of Lord Dalhousie, while that in the centre is of Lord Hastings (by Flaxman, R.A.).

Passing through the Queen's vestibule into the Queen's Hall under the dome, one sees the dignified statue of Queen Victoria at the age when she ascended the throne (the work of Sir Thomas Brock, R.A.); this gives the key-note to the whole edifice. On the marble panels in the recesses of the walls are engraved in several languages proclamations to the people of India by Queen Victoria, while the mural paintings encircling the gallery (by Frank Salisbury) illustrate the principal events of her lifetime. These will be better seen across the hall from the gallery itself.

The bronze doors on the two sides of the Queen's Hall are fine example of modern workmanship, and beyond them on the terraces are groups of statuary, with Lord Cornwallis (by John Bacon, jr.) as the central figure of the one (on the east) and Warren Hastings (by Sir Richard Westmacott, R.A.) as the central figure of the other (on the west).

Continuing through the building we come to the Princes' Hall. The statue of Lord Clive, a replica of that (by John Tweed) which stands outside the India Office in London, and two French guns captured at the Battle of Plassey are the principal objects on view, besides the busts of distinguished men which here find a place.

On the left is the Darbar Hall, undoubtedly the finest hall in the building. The War enforced economy, and the change from marble to Chunar stone enhances greatly the general effect. The Art collection comprises Miss Eden's water-colour sketches, Atkinson's mutiny drawings, miniatures on ivory, engravings, and a fine collection of Oriental paintings. Philatelists will ask to be shown the stamp collection, while others will be interested in the last uniform worn by King Edward VII. On the dais at the east end of the Hall stands the Stone Throne or Musnad of the Nawabs-Nazim of Bengal, an exhibit of considerable historical interest, dating from 1641, according to the inscription.

Across the Princes' Hall is one of the Picture Galleries, containing pictures and engravings by Thomas Daniell (1749-1840, R. A.), and his nephew William (1769-1837, R. A.). Among these, the collection presented by Queen Mary is of considerable interest. Other paintings include portraits of Abu Taleb Khan by Northcote, Sir Elijah Impey by Kettle, Rudyard Kipling by Burne Jones, Burke and Macaulay; also "The Embassy of Hyder Beck" and "Lord Cornwallis receiving the son of Tippoo Sahib," by Zoffany. The models of the Battle of Plassey and of an East Indiaman sailing ship, and the collection of arms and armour supply a variety of interest.

The visitor should now proceed to the Picture Gallery on the first floor, where he will find a collection of paintings of the time of Warren Hastings. These include portraits of Warren Hastings and of Mrs. Hastings in a group, and a very fine one of Mrs. Hastings, all by Zoffany, a portrait of the former by Lemuel Abbott, and another attributed to Hoppner. The centre room contains a large collection of engravings and medals, while in the "Calcutta" room at the end, among others, will be found Daniell's prints of Old Calcutta and a model of Fort William. Two fine oil paintings by Thomas Daniell, one representing Old Court House Street as seen in 1780, the other depicting a scene on the Hooghly with the present Fort William in the distance, should not be missed.

Among the historic documents in the annexe is the original indictment of Nand Coomar for forgery of the bond, which is also on view in original.

A tour of the Gallery round the interior of the dome should be made to view the mural decorations, and those who wish to do so may ascend to the top of the dome. As the door leading to the dome is kept locked, application should be made to the Superintendent at his office in the entrance hall on entering the building. The echo in the space between the outer and inner domes, and the whispering gallery inside the circumference of the dome, are both remarkable instances of these phenomena.

In the grounds will be found, on the south the King Edward VII. Memorial Arch by Mackennal, A. R. A., and a Turkish gun captured in Mesopotamia. The statue of Lord Curzon is the work of Pomeroy, R. A. On the north the bronze statue of Queen Victoria is by Frampton, R. A., and the surroundings of the statue and the entrance gates were designed by Mr. V. J. Esch, C.V.O.

The Memorial is open on Sundays and week-days (excluding Mondays) from 10 a.m. to 5 p.m. (4 p.m. during the winter months). On Fridays there is a charge of 8 annas, which admits to the whole building. On other days entrance is free, but a charge of 4 annas is made to view a part of the collections. On Mondays the building is closed to visitors.

An illustrated catalogue (Re. 1) can be purchased from the attendant.

The Curator (Mr. F. Harrington, office on first floor) may be consulted should exhibits not be in place owing to rearrangement.

IMPERIAL LIBRARY.

It is frequently supposed that most of the public institutions in Calcutta derive their importance from the fact that Calcutta was the Capital of India prior to 1912. This is not true at any rate in the case of the Imperial Library, which grew out of the Calcutta Public Library, founded in 1835 in pursuance to the resolution adopted at a public meeting held in Calcutta. The Library was located

in the house of Dr. F. P. Strong in Esplanade Row from its foundation to the latter part of July 1841, and subsequently in a portion of the College of Fort William till June, 1844 when it was removed to the upper floor of the Metcalfe Hall, which had been built on a piece of land granted by the Government in 1840 to commemorate Lord Metcalfe, who had removed some restrictions on the Indian Press by his Act of September 15, 1835. The building also housed the Agri-Horticultural Society of India. The Government of India acquired the entire building and the books of the Library in December, 1901, and amalgamated these with those comprised in the then Imperial Library. The re-organised Library was opened to the public on January, 30, 1903, in terms of the Imperial Library Act, 1902 (Act I of 1902). The Imperial Library was removed from the Metcalfe Hall to its present site in 1922.

The Imperial Library is the largest library in India, but it is still very small compared with, say, the Library of the University of Tokyo. That is perhaps not to be wondered at, for the public demand for a library, to which such libraries as the Tokyo University Library and the Imperial Library are the answers, is very much weaker in India than in Japan. It is hoped that the Imperial Library will before long be built up to something much more imposing. It will be doubtless made a Copyright library, for instance. Meanwhile, it can be said to have been of notable service to the small number of scholars in India who have made names for themselves beyond the confines of India, and it has been a place where many young men have read extensively after finishing their College careers.

The class in which the Imperial Library is strongest is naturally the class of books and pamphlets dealing with India. The aim is to have in the library everything in whatever language that has been written about India. Much has been done in collecting printed materials, but of manuscript material the Library still possesses hardly anything. The most important books in the English language in other classes are regularly got, unless there is a near-at-hand library, such as the Library of the Commercial Intelligence Department (technology) from which books can be borrowed. When there is, the getting of the books in the classes in question is left to that library.

There is a very valuable collection of Arabic and Persian MSS., and a collection, but not so valuable, of Sanskrit MSS. There are fair beginnings of collections of prints and maps.

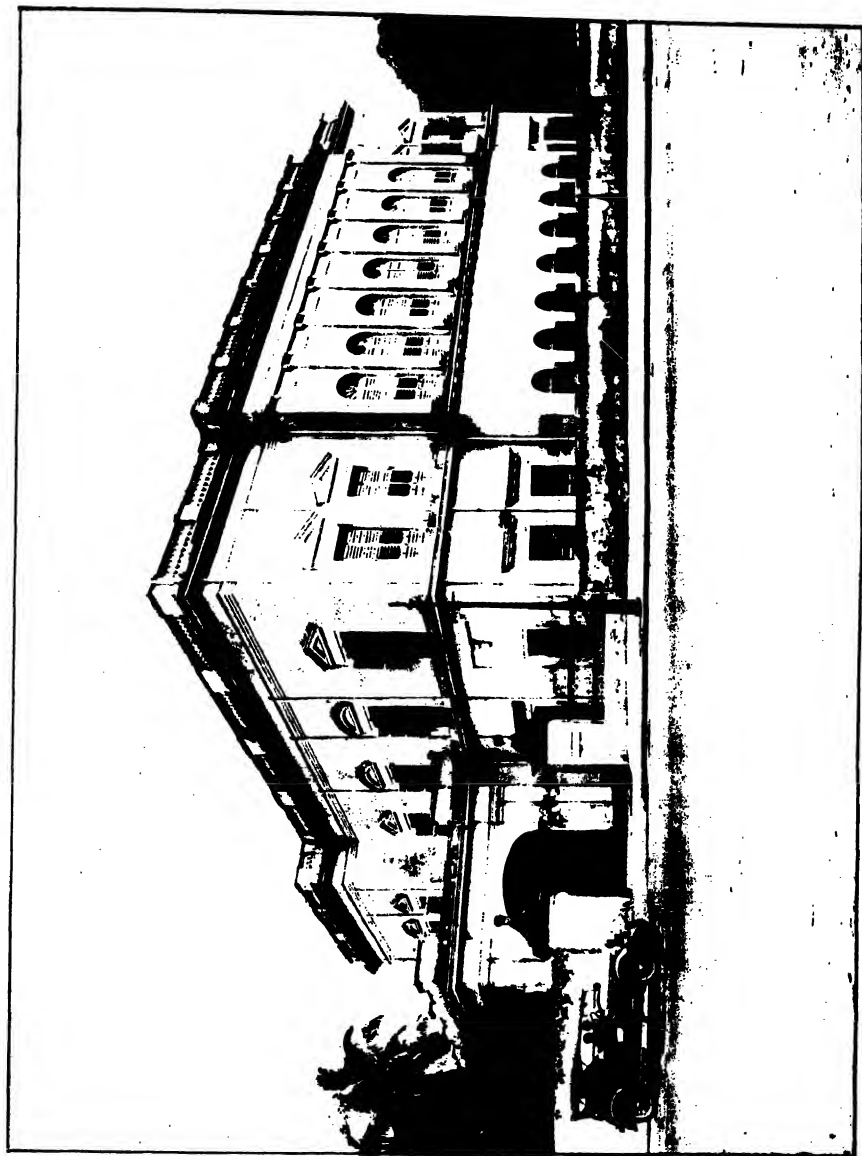
The Catalogues of the Library form a body of bibliographical material of very great value. Those in the form of printed volumes (other of the catalogues are in card form in cabinets) include an Author Catalogue in two volumes, with a supplement, also in two volumes; a Subject-Index in two volumes, and a supplement, to be printed, is in preparation, a *Catalogue raisonné* of the Arabic MSS., a *Catalogue raisonné* of the Persian MSS., and a similar catalogue of the Sanskrit MSS., are in preparation.

The Library, besides having reading rooms at the Foreign and Military Secretariat, Esplanade-East, Calcutta, which are open to the general public (but not to those under eighteen years of age), is a Lending Library; as such it sends books all over India, Burma, and Kashmir, and occasionally even further. There is no charge made for using it. The entire cost of the Institution is borne by the Central Government.

The Library remains open from 10 to 7 every day except on Gazetted holidays when it is open from 10 to 5. On Sundays it remains open from 2 to 5.

ASIATIC SOCIETY OF BENGAL.

The Asiatic Society in Calcutta, the oldest literary and scientific society in the East (with the exception of the Bataviaasch Genootschap van Kunsten en Wetenschappen), was founded in 1784 by Sir William Jones. Already a master of several oriental languages on his appointment in 1783 as a Puisne Judge of the Supreme Court, Calcutta, one of his first acts on his arrival was to invite the leading citizens of Calcutta to discuss the formation of a research society, and on the 15th January, 1784, the Asiatick Society came into being, with Sir William Jones as President and Warren Hastings as Patron. Its scope was defined in the President's first address in words which were paraphrased in the first number of its Journal as: "the bounds of its investigations will be the geographical limits of Asia and within these limits its enquiries will be extended to whatever is performed by man or produced by nature."



ASIATIC SOCIETY OF BENGAL.

In its early years, meetings were held in the Grand Jury's room in the Supreme Court. In 1805 Government sanctioned a free grant of the present site at the corner of Park Street and Chowringhee, and a building, designed by Captain Lock of the Bengal Engineers, was completed in 1808, the cost being defrayed by the members. Extensive additions and alterations have since been made, but the main structure remains as it was in 1808.

One of the Society's first activities was the publication of the "Asiatick Researches." Twenty volumes of this serial were published between 1788 and 1836 when, owing to financial difficulties, it ceased to appear. That there was a distinct demand for the work produced, however, is borne out by the fact that more than one "pirated" edition was printed. The proceedings of the Society's monthly meetings appeared in a private journal called "Gleanings in Science." The editors of this monthly obtained the permission of the Society in 1832 to use its name in connection with a new Journal,* also a private venture. Full control of the Journal was assumed by the Society in 1843. Seventy-four volumes of the "Journal" were published between 1832 and 1904, and 40 volumes of the "Proceedings," started in 1865. In 1905 the two were amalgamated as the "Journal and Proceedings of the Asiatic Society of Bengal, New Series," of which 21 volumes have been issued. Another serial, of quarto size, was started at the same time called the "Memoirs of the Asiatic Society of Bengal," for the publication of larger articles or those requiring more elaborate illustrations. Ten volumes of this serial, four of which are still in progress, have been published.

One of the most important of the Society's activities is the publication of the *Bibliotheca Indica*, a series of texts in Sanskrit, Persian, Arabic and other languages, frequently also with translations. From 1848 till the present day 1,760 fascicles have been published. Huge works like the Persian Akbar Nama and the Ain-i-Akbari, and the Sanskrit Sahitya-Darpana, have been edited and translated in this series, and many of the most famous oriental scholars have contributed. If one was asked to specify a particular domain in which the

*On the title page it was called "The Journal of the Asiatic Society of Bengal." The Society fitly retained its title of "The Asiatic Society." By the time the Journal became the property of the Society the provincial title had already become familiar. It was incorporated in the code of bye-laws in 1851, and registered in 1876. An effort was made in 1899 to revert to the original name of "The Asiatic Society," but the requisite three-fourths majority was not obtained.

publications in this series have been eminently useful, one might mention that of Buddhist Sanskrit literature. The Society is at present engaged in the publication of eleven separate works in this series.

The Society has published from time to time a large number of miscellaneous works such as catalogues and dictionaries. One of the most important in recent years is S. W. Kemp's Catalogue of Scientific Serial Publications in the Principal Libraries of Calcutta.

The Society has succeeded in building up a large manuscript library. Its Persian, Arabic, Turkish, etc., collections run to about 5,000 volumes. These were started by donations and legacies from early members. The transfer, in 1835, of a part of the library of the College of Fort William substantially enriched it. In the early years of this century the enthusiastic activity of Sir E. Denison Ross secured financial assistance from the Government of India for many further acquisitions, and the collection is now one of the largest and most important in the world. The arduous but all-important task of cataloguing (undertaken by W. Ivanow) is now nearing completion. The Persian Mss. have all been catalogued and work on the Arabic collection is progressing rapidly.

The Sanskrit manuscript collection is still larger, about 16,000. Special attention may be drawn to the beautiful Buddhist pictures of the tenth century in the *Astasahasrika Prajñāparamita* Ms. and of the seventh century *Guptaksara* Ms. of the *Kulalikamnaya*. This collection also owed many of its early acquisitions to the Library of the College of Fort William, and later additions have been mainly due to the enlightened policy of the Governments of India and Bengal. The resources normally used for search and purchase are being used temporarily for cataloguing. Of the monumental catalogue that is being prepared by Haraprasada Shastri, 4 volumes (of 2,850 pages), Buddhistic, Vedic, Smṛti and Historical-Geographical, have already appeared. Others are in active preparation.

The small but picturesque collection of Burmese manuscripts should also be mentioned.

The Society possesses several important manuscript drawings, such as Buchanan Hamilton's famous collection of zoological drawings.

Although not, strictly speaking, manuscripts, the collection of Tibetan xylographs may be mentioned here. They include complete sets of the *bsTen-hGyur* and *bKah-h-Gyur*.

The Library of printed books is particularly rich in scientific and philological serial publications, including many valuable early sets. Accession lists are published quarterly. A new edition of the Library Catalogue is now in the press.

As already stated, the Indian Museum owes its existence to the Asiatic Society. In virtue of its renunciation of its claim to accommodation in the Indian Museum building, the Government of India made over to the Society Rs. 1,50,000, which still forms the major portion of its Permanent Reserve Fund.

The Society's rooms are adorned by many works of art. In the centre of the meeting room is a marble bust (by H. Weekes) of the founder, Sir William Jones, and a portrait of him as a boy by Sir Joshua Reynolds. This and many other pictures form part of the Home bequest presented by Brigadier and Colonel Home in memory of their father Robert Home, portrait painter to the king of Oudh, and from 1802 to 1804 Secretary of the Society. The marble busts include two beautiful ones by Sir Francis Chantrey—of W. H. Mill, the author of that remarkable Sanskrit work "*Christa-Sangita*," and of H. H. Wilson, for many years Secretary of the Society and afterwards first Boden Professor of Sanskrit at Oxford. At the top of the staircase there is a beautiful bronze bust of Czoma de Körös (by B. Holló), the pioneer of Tibetan scholarship and for many years on the Society's staff; facing this is a bronze bust of Sir Asutosh Mookerjee (by H. I. Youngman), who guided the Society's destinies for many years until his death in 1924. On the landing too may be seen a famous edict of Asoka (about B. C. 250) whose Pali characters were deciphered by James Prinsep, for many years Secretary of the Society, and to whose memory the public of Calcutta have erected a magnificent "ghat" near Fort William. A marble bust (by H. Weekes) of this first decipherer of the ancient alphabets of India also adorns the landing.

These works of Art alone call for a visit from the members of a Congress like the Indian Science Congress.

The Council of the Society meets once a month throughout the year. Ordinary Monthly Meetings are held on the first Monday of

every month with the exception of September and October. The Ordinary Annual Meeting takes place in February. Several public lectures are arranged each Winter.

Although the founder of the Asiatic Society in his inaugural address said " you will investigate . . . their skill in chirurgery and medicine, and their advancement whatever it may be, in anatomy," the Asiatic Researches contain little on these subjects. In 1823 the Medical and Physical Society was founded in Calcutta by John Adam and James Hare and met monthly in the Asiatic Society's Rooms. A portrait of Adam by G. Beechy hangs on the Society's staircase and one of Hare by R. Home in the Eastern bay of its main hall. The Medical Society published its own "Transactions" from 1825-1845. The Medical Section of the Society was not started till 1906, with Lt. Col. F. P. Maynard as its first Secretary. This section generally meets on the second Wednesday of the month. Papers read are usually published in the "Indian Medical Gazette," the Proceedings of the Asiatic Society containing only short abstracts of them. On the formation of the Calcutta School of Tropical Medicine, the Society, realising that its extensive collection of medical periodicals would be more valuable for research purposes in that institution, consented to their transfer.

The Society fostered the formation of the Indian Science Congress, which held its first session in the Society's Rooms in 1914. The Asiatic Society is responsible for the management of the work of the Congress when not in session, and publishes its "Proceedings."

THE BANGIYA SAHITYA PARISHAD.

The Bangiya Sahitya Parishad was established on the 29th April, 1894, when about thirty gentlemen, who used to meet at the residence of the late Raja Benoy Krishna Deb of Sobhabazar to discuss topics bearing on Bengali literature, re-constituted themselves on a wider basis into the present Society, under the presidency of the late Mr. R. C. Dutt, I.C.S., C.I.E., with a definite programme for the cultivation and improvement of the Bengali language and literature. During the first six years its meetings were held at the house of Raja Benoy Krishna. The Parishad was then, for a time, removed to a small building in Cornwallis Street rented for the purpose. The

present building, built on a plot of land, a munificent gift from the Maharaja Sir Manindra Chandra Nandy of Cossimbazar, was completed and formally occupied by the Parishad in 1908.

Aims and Objects.

During the thirty-two years of its existence the Sahitya Parishad has developed along a certain definite line of growth, and has grown into a Society with a four-fold character. *Firstly*, it is a Society which has not only the study and development of the Bengali Language and literature for its main object but which also encourages and includes historical, archæological, sociological, and other scientific studies and researches with special reference to this province within the scope of its investigation. To carry out these objects, it at present undertakes to publish useful original books and translations from the best books in the Sanskrit, Arabic, English or other European languages; and to help meritorious writers; and it watches with interest the educational policy of the Government and the Calcutta University as far as it affects the cause of the Bengali language and literature. *Secondly*, it seeks to collect and preserve old Bengali manuscripts and objects of historical, archæological, ethnological, literary and scientific interest. *Thirdly*, it tends to foster the general spirit of research among the literary, scientific, historical and philosophical students of Bengal, and publishes the results of their researches through the medium of the Bengali language. *Fourthly*, it affords a meeting ground for its members and other distinguished men for mutual intercourse, and exchange of views on matters of literary and scientific interest.

Members.

The Parishad has six classes of members, viz. :—*Honorary, Life, Adhyapaka, Maulavi, Ordinary, and Associate* members.

1. Literary persons who, by means of their erudition and scholarship are renowned not only in this province but whose reputation has spread far and wide are elected as *Honorary Members*. The number of such members is limited to 15.

2. Gentlemen who contribute not less than Rs. 500/- to the Reserve Fund of the Parishad are elected as *Life Members*.

3. Sanskrit Scholars of repute, taking a genuine interest in the furtherance of the cause of the Bengali language and literature, are eligible for election as *Adhyapaka Members*. The number of such members is limited to twenty-five.

4. Arabic and Persian Scholars of repute taking a genuine interest in the advancement of the Bengali language and literature are eligible for election as *Maulavi Members*. The number of such members is limited to five.

5. Persons who take general interest in the betterment of the Bengali language and literature are eligible for election as *Ordinary Members*.

6. Gentlemen who help the Parishad by literary and other services as elected as *Associate Members*. The number of these members is limited to twenty-five and they are selected for five years only.

At the beginning of the thirty-second year there were 2,120 names on the rolls of its members.

Bandhab (Patron).

Besides these six classes of members, the Parishad recognises a special class. Those who contribute to the Funds of the Parishad either in cash or in kind, Rs. 5,000/- or more are designated *Bandhabas*.

Funds.

The Ordinary members have only to pay an admission fee of Re. 1/- and a minimum subscription of six rupees a year. The Government of Bengal has been good enough to help it with an Annual grant of Rs. 1,200/-. This, with other donations, constitute the Publication Fund of the Parishad, specially earmarked for the publication of literary and scientific works. It also receives an annual grant from the Corporation of Calcutta for its Library. There are several other funds earmarked for special purposes in accordance with the wishes of the donors and subscribers.

For the last official year the gross receipts of the Society amounted to Rs. 21,952-8-7 and the gross expenditure to Rs. 21,892-11-3.

Meetings and Journal.

Ordinarily, the Parishad holds one General Meeting in every Bengali month, when papers previously approved by the Council are read and the reading is usually followed by discussions. The exhibition of objects of literary, historical and scientific interest always forms an interesting feature at these meetings. Besides these meetings special sittings are held for courses of lectures by well-known writers.

The Parishad issues a quarterly journal—the Sahitya Parishad Patrika—which is supplied free of charge to all members and at Rs. 3/- for each annual volume to others. A high standard of research and scholarship is maintained in the selection of articles for the Journal. The Editor is helped by a Publication Committee.

Library and Reading Room.

The Library of the Parishad is rightly reckoned as a unique one in the entire province of Bengal, its aim being a complete collection of Bengali works, ancient and modern. At the end of the last official year, the Library contained more than 50,000 volumes and about 5,000 manuscripts.

It is a matter of satisfaction that several public and private Libraries have been incorporated in that of the Parishad, the chief of which are :—

- (1) The Library of Babu Sukumar Haldar.
- (2) The Library of the Bandhab Society.
- (3) The Library of the late Babu Kailash Chandra Sinha.
- (4) The Tibetan Buddhist Commnetary—the Bstan-Hgyur (Tanjur) & Bkah Hgyur Kanjur consisting of 1,000 volumes of block-print books in pothishape.
- (5) The Library of the late Pandit Isvar Chandra Vidyasagar.
- (6) The Library of the late Babu Satyendra Nath Dutt, the poet.
- (7) The Library of the late Mr. Ramesh Chandra Dutt, C.I.E., the First President of the Parishad.
- (8) The Library of the Sahitya Sabha.
- (9) The Library of the late Babu Jnan Chandra Chaudhury.

As already mentioned, the Parishad has been receiving an annual grant from the Corporation of Calcutta for its library.

The Reading Room is open to the public. All the Mofussil and Calcutta papers published in Bengali and a few English papers are laid on the table.

Collection and Preservation of MSS.

The rescue and preservation of the old literature of Bengal, invaluable, apart from literary considerations, for the solution of many historical and philosophical problems, is one of the primary objects of the Parishad. The Library of the Parishad as it stands at present is the best and richest collection of Bengali Manuscripts in the Province.

Publications.

The Parishad not only undertakes the collection and preservation of ancient MSS. but also the publication of the most important of these in separate volumes with introduction and notes by well-known scholars. Several of these publications are unique as regards their script, language and contents. From the list of the books which have already appeared—they number 73, several of them running to more than one volume—it will be clear that besides scholarly works, the Parishad encourages publication of useful literature in all the different branches of knowledge.

Museum.

The Parishad has been extremely fortunate in procuring a variety of exhibits chiefly of historical and archæological interest, and thus it has in its possession a very promising nucleus of a Museum chiefly provincial in character, and in a way supplementary to the Indian Museum of Calcutta. Its collection comprises images of the Gandhara, Kushan, Magadha and Bengal Schools. Besides a large number of these images of metal as well as stone, there is a rich collection of rare old coins in its Cabinet. Some of these specimens are quite unique, and among these may be mentioned three bronze images which were described by the renowned Art critic. Mr. William Rothenstein—a former President of the Indian Society

of London,—as “impossible to match.” There is a collection of the personal relics of the distinguished literary luminaries of the Province. The *pagree* or head-dress, and the plaster cast of the head of Raja Rammohan Roy are interesting. The Parishad may also veritably be called a National Portrait Gallery, owing to its possession of a very large number of portraits of the distinguished sons of Bengal.

An Etymological Dictionary.

The compilation of a comprehensive etymological dictionary of the Bengali language is a huge task appropriately taken up by the Parishad. The Parishad is in possession of a number of collections of words by various hands, chief among which is that of Pandit Isvar Chandra Vidyasagar, consisting of over 7,000 words. The “Sabdakosha” of Rai Bahadur Jogesh Chandra Vidyanidhi, which is a publication of the Parishad, is the first attempt on scientific lines.

Translation of Scientific Words.

The Parishad has worked on removing the absence of suitable scientific and technical words in the Bengali language. Fairly complete lists of scientific terms in the different branches of Mathematics, Astronomy, Chemistry, Geography, Biology, Medicine and Mineralogy have been published in the Journal.

R. C. Dutt Memorial Hall.

The Parishad suffers from the want of sufficient accommodation in housing the daily growing collection of books, old manuscripts and exhibits for the museum. To remedy this, it was decided to erect a hall which is to be named *Ramesh Bhaban* for perpetuating the memory of the late Mr. R. C. Dutt, the first President of the Parishad. The plot of land on which it is built was the free gift of Maharaja Sir Manindra Chandra Nandy Bahadur. The ground-floor is almost complete.

Branches.

In order to extend the scope of its activities, and to instil into students who are not resident of Calcutta a spirit of research and intellectual activity, the Parishad has affiliated a number of branches in different parts of the country, *e.g.* at Rangpur, Murshidabad, Rajshahi, Bhagalpur, Burdwan, Gauhati, Chittagong, Dacca, Barisal, Bankura, Krishnagore, Kalna, Benares, and Delhi.

Sahitya Sammilan.

The Sahitya Parishad has also been entrusted with the duties connected with the general management and organisation of the Bangiya Sahitya Sammilan, or Bengal Literary Conference, which has held sixteen sessions up till now. This annual gathering consists of four sections, *viz.* :—Literature, History, Philosophy and Science. Illuminating and original articles are read during the sessions, and also exhibitions are held.

Student-Members.

Following the suggestion of Dr. Rabindra Nath Tagore, the Parishad introduced the system of taking in student members for the purpose of training them in the most approved and useful methods of pursuing and carrying on independent research and investigations. These student-members are usually elected from the undergraduates and graduates of the University and some of them have made full and good use of the opportunities thus afforded.

Other Activities.

(1) The Parishad has always moved for better recognition for the Bengali language in the educational policy of both the Government and the University. As a result of these activities the Government of Bengal as well as that of India recognised the importance of the vernacular up to some stage of instruction. As early as 1896, the Parishad fought for a place for the vernacular in the University examinations with some success. The Parishad now records with great satisfaction that considerable changes have been introduced in the University curriculum in the matter of the vernaculars almost on the lines suggested by the Parishad in 1896.

(2) The Parishad has been entrusted with the task of perpetuating the memory of the renowned literary men of the province, for which there are separate funds raised by public subscription.

(3) There is a Fund for helping the deserving literary men who are in straitened circumstances.

SAROJ NALINI DUTT MEMORIAL ASSOCIATION.

The Saroj Nalini Dutt Memorial Association for Women's Work in Bengal was founded on the 23rd February, 1925, to perpetuate the work of Srimati Saroj Nalini Dutt, M.B.E., who passed away at the early age of 37 after having devotedly laboured for the uplift of the women of Bengal. She came to the deep conviction that it was through the organisation of the women into Mahila Samitis that the welfare of women could alone be secured. The Memorial Association has taken up the work which Srimati Saroj Nalini attempted but left unfinished, and the basic principles of the Association's work is the organisation of the women themselves into groups for their own social, economic and educational emancipation, the awakening in them of a sense of their own responsibility for the work of uplift instead of depending merely upon men, and inducing them to take up a definite programme of work towards attainment of this object.

Briefly speaking the following are the aims and objects of the Association :—(1) To help in establishing Mahila Samitis in towns and villages of Bengal, (2) to help in establishing a Central Federation of Mahila Samitis in the province of Bengal, (3) to arrange for the teaching of useful arts and handicrafts to women through Samitis, (4) to help in establishing *dhai* training classes and baby clinics through the different Mahila Samitis, (5) to arrange for travelling lecturers, instructors and workers to help Mahila Samitis, (6) to help in establishing girls' schools through Samitis, (7) to help in establishing Maternity wards in different places, (8) to help the cause and interests of women's welfare generally.

Central Association.—The Central Association, of which the office is situated at 45, Beniatola Lane, Calcutta, acts as friend and guide to the affiliated Mahila Samitis. When the Central Association came into being in February, 1925, there was only 7 or 8 Mahila Samitis in existence. At the end of the year 1926, the number rose to 101; but, at the end of the year 1927, the number now stands at 160. The Mahila Samitis at Baraset, Talla, Nimta, Jalalpur and Brahmanrangdia have been formally registered under the Co-operative Societies Act and enjoy the distinction of being the first Women's Co-operative Societies in India.

The activities of the Central Association fall under five heads :—

- (1) Propaganda work for the establishment of new Mahila Samitis,
- (2) guiding and co-ordinating the work of Mahila Samitis, (3) sending out trained instructresses to teach cottage industries to members of the Samitis, (4) conducting the monthly journal *Banga Lakshmi*, (5) maintenance of a Women's Industrial School in Calcutta.

The Central Association maintains two Publicity Officers for the purpose of carrying on systematic propaganda work throughout the province by directly appealing to women to organise themselves into Mahila Samitis for combined work in the sphere of education, child welfare, maternity and hygiene, and, in particular, in domestic industries. The response to the appeal made by them has been remarkable. Their magic lantern lectures have been very popular, and our Publicity Officers visited almost all the districts of Bengal for establishing Mahila Samitis.

There is a wide-spread demand for the services of trained instructresses to teach various cottage industries to the members of Mahila Samitis in the *moffusil*. The Association has now employed seven instructresses who are touring the different districts, staying for three months at each place.

The Industrial School.—The Association is conducting the biggest free Industrial School for women in Calcutta. The subjects taught in the school are :—

Sewing, cutting, embroidery, chicken work, lace making, drawing, painting, cane work, raffia work, silk and jute spinning, carpet weaving and general education. Training in the industrial classes, which is free, generally takes one year. The pupils all pay bus fees. But those, who sign an agreement to serve the Association as paid instructresses on the completion of their training, are charged no fees whatever. The Association is thankful to the Government and the Calcutta Corporation for a monthly recurring grant amounting to Rs. 650/- and Rs. 350/- respectively, exclusively for the school. The school and the office of the Central Association have been visited by Her Excellency the Hon'ble Lady Jackson and numerous other distinguished persons, both Indian and European.

Work in the Villages.—The Central Association has introduced into the hitherto stagnant life of the women of Bengal, a magnetic force which is galvanising them into active desire for the acquisition of knowledge of domestic hygiene and the science of maternity and child welfare and for receiving training in various cottage industries and which has been awakening their slumbering spirit of social service for ameliorating the condition, not only of themselves but of the community generally.

Several Mahila Samitis have started girl's schools for imparting primary education to young girls, and some of the members are themselves teaching in the schools. Such schools have been started at Baraset, Tala, Satsang, Barisal, Bally, Chandpur, Natore and others. The Mahila Samitis have proved an effective factor in stimulating and spreading cultural education among adult women. They are encouraged to read periodical literature and discuss current topics of interest.

A few of the Mahila Samitis have succeeded in establishing permanent Maternity wards. Among these the Saroj Nalini Maternity Ward at Bankura and the Golokmani Matriniketan at Barisal deserve special mention. One of the most important aspects of the movement is an endeavour to give an impetus to Cottage Industries. There is not a single Samiti now existing which has not adopted one or more Cottage industries to better the economic condition of its members. The possibility of the Samitis in *moffusil* areas is being explored by the Association. A large kitchen garden, on which 10 members are working, is being run by the Talla Mahila Samiti.

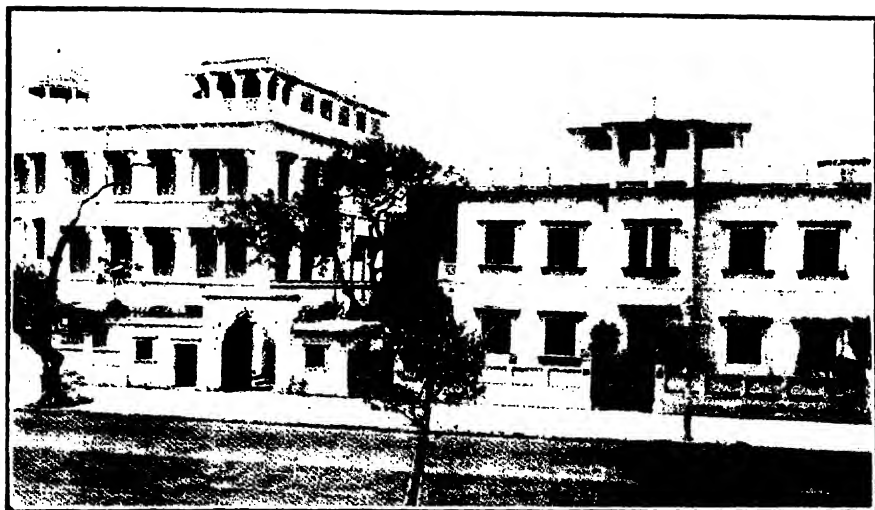
The Association has to spend Rs. 3,000/- a month on its work. It has been decided to raise a capital fund of two lakhs from the interest of which the greater portion of the heavy recurring expenses can be met. An appeal is being made to the generous public to help to raise this sum and thus earn the gratitude of hundreds of women in the *moffusil* whom the Association is helping in their upward struggle.

THE BOSE RESEARCH INSTITUTE.

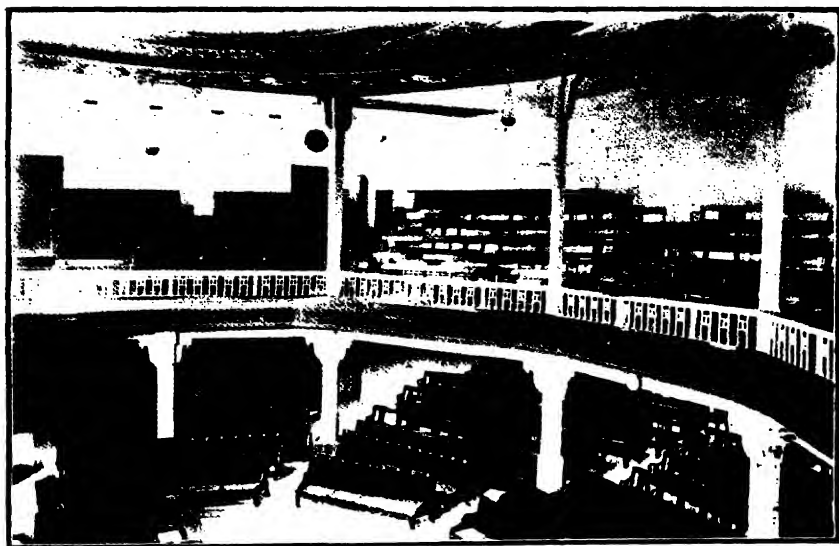
The Bose Research Institute at Calcutta was founded and built by Sir J. C. Bose as a place where he and his successors might carry out researches on the phenomenon of life, and its various manifestations. It was publicly inaugurated on November 30, 1917, and has been in active operation ever since. It is a handsome building in Indian style, and has a large auditorium capable of accommodating 1,500 persons, the acoustics of the Hall being almost perfect. No elementary teaching is undertaken; the only object is post-graduate research. Carefully selected scholars are admitted on condition that they devote themselves wholly to the prosecution of research, not for the satisfaction of personal ambition, but in the words of the founder, "in order to realise an inner call to devote one's whole life to win knowledge for its own sake and to see Truth face to face."

Recent investigations carried out at the Institute establish the important generalisation of the fundamental unity of plant and animal life. Investigations on the physiological mechanism of simple vegetable life, has led to the better understanding of the more complex mechanism of animal life. The conducting tissue in the stem and leaf was located by the *Electric Probe*. The physiological nature of the conduction is established by the observation that, both in the plant and in the animal nerve, conduction is affected by changes of temperature, by blocking and stimulating agents, which could not have any such effect upon it were it merely mechanical. In this simple 'nervous system' there is no central organs such as brain; only nerves of which some have been shown to be sensory, others to be motor. The "Circulatory system" consists entirely of strands of propulsive cells distributed throughout the plant, representing a contractile arterial system.

This advance of knowledge has been rendered possible by the invention and construction at the Institute of numerous automatic recorders of high sensitivity and precision. Besides the *Electric Probe*, the *Resonant Recorder* registers times as brief as a thousandth part of a second, enabling the most accurate determination of velocity of nervous impulse in plants to be made. The *Photosynthetic Recorder* automatically inscribes on a revolving drum the carbon assimilation in plants and exhibits the extraordinarily great increase in



THE BOSE RESEARCH INSTITUTE.



THE BOSE RESEARCH INSTITUTE.
Auditorium with accommodation for 1500 persons.

its power of assimilation produced by infinitesimal traces of certain chemical substances. The *Magnetic Crescograph* enables movements, which are beyond the highest powers of the microscope, to be detected and recorded. The magnification produced can be carried to fifty million times. The imperceptible rate of growth and its induced variations under chemical or electric stimulants can be instantly measured.

The specific action of a drug can be immediately detected by its action on the pulse-beat of plant and animal. The pulsating organ of the plant was first subjected to the action of the drug; parallel experiments on the animal heart gave results which are extraordinarily similar. The recently invented *Resonant Cardiograph* inscribes the different phases of the heart-beat with unprecedented accuracy, the successive dots in the record measuring time as short as a hundredth part of a second. A very extensive field of investigation has been opened out on the action of extracts from various plants, the medicinal properties of which had not hitherto been suspected. By the employment of some of these the heart-machine can be regulated, enhancing or lowering its activity.

A complete account of these investigations will be found in various books published by Messrs. Longman Green & Co. Copies can be had at the Institute.

ALIPORE OBSERVATORY.

Seasonal weather with its variations has always been an important factor in India. From the earliest times of British interest in this country more or less desultory observations were taken at the instance of various officers scattered in different parts of the country. Observations before 1865 have mostly been found to be of little value.

In Calcutta, at the Survey Office in Park Street, systematic observations commenced in 1853. This observatory used also to give time-signals to shipping in the port. Interest in the meteorology of India in general, and of Bengal in particular, received an impetus after the great Cyclone that visited Calcutta in October, 1864. It was accompanied by a storm wave up the Hooghly. Over 80,000 human beings were drowned or died of exposure, and a great part of the shipping on the river was wrecked. As a result of the awakening of interest in weather phenomena, five provincial systems of observa-

tions were evolved during the period 1865-1874. The one for Bengal came into being in 1867, under the Reportership of Mr. H. H. Blandford, who was then Professor of Science in the Presidency College and one of the Honorary Secretaries of the Asiatic Society of Bengal.

About 1874, on the recommendation of the English Meteorological Council a re-organisation of the observational work in India was contemplated by Government, and Mr. Blandford was appointed the Imperial Reporter. He drew up a scheme for an All-India service, which was launched in 1875. The Alipore Observatory was established as one of the initial items of this scheme. The objects of the Observatory were manifold. Some of them were:—Recording of observations of various meteorological elements, maintaining autographic instruments also for this purpose; providing a central depot for verification of instruments for other observatories, and a training ground for observers. Experimental observations and special investigations were also part of the Observatory's programme of pioneer work, which commenced in 1877, just half a century ago. With the initiation of this institution, observations at the Survey Office were stopped. A little later when Alipore had its equipment for time determination, the function of dropping the Time-Ball on the Semaphore Tower of Fort William was also taken over from the Survey Office.

Another important project in Mr. Blandford's programme was the inauguration of Daily Weather Reports. The first to begin was one in Calcutta in 1877. Observational data were collected by post, and charts were prepared at the central office. The droughts and famines of 1876 and 1877 made Government anxious for quicker weather information. An advance in this direction was made in 1878 when observations began to be telegraphed in code to weather report headquarters. In addition to the new Imperial organisation of Mr. Blandford, there were also working the original Provincial organisations. Among these continued the one for Bengal with the functions of issuing weather reports and managing the gradually expanding storm-signal service. This service, which commenced about 1875 with a nucleus of 5 observatories round the Bay, was substantially augmented and re-organised in 1880. Subsequently, from time to time, improvements were introduced, until, finally, the advent of wireless

telegraphy ushered in an era of increasing usefulness to the shipping world.

Thus in Calcutta there were in the late 'eighties of the last century side by side, firstly, the Imperial section of meteorological work, gravitating round the Alipore Observatory and, secondly, the offices of the Bengal Meteorological Reporter. Sir John Eliot succeeded Mr. Blandford in 1889, and immediately proceeded to consolidate the results of the pioneer work of his predecessor. He handed over the charge of the Alipore Observatory to Mr. Little, whom he appointed as "Second Assistant Meteorological Reporter to the Government of India." The same year the Calcutta branch of the India Meteorological Office and the Bengal Meteorological Office were combined. This combined office served as the principal office of the department, until the Simla branch gradually grew up and assumed supreme position about 1905. In 1904 Sir Gilbert Walker had succeeded Sir John Eliot as the Director-General of Observatories in Simla. In Calcutta there was the Meteorological Reporter to the Government of Bengal responsible for the local weather report and the storm signal service for the Bay of Bengal. There was also the Second Assistant Meteorological Reporter of the central service in charge of the Alipore Observatory. Sir Gilbert amalgamated these two offices and appointed Professor Peake of the Presidency College to this new post of "Meteorologist, Calcutta." Until as recently as 1926, the tradition of the Professor of Physics, Presidency College, holding the part-time post of "Meteorologist, Calcutta" still held good.

In 1922 the Storm Warning duties for the Bay of Bengal were taken over by Simla headquarters from Alipore. Subsequently however, the Government of India decided to re-transfer the Storm Warning service to Calcutta under a wholetime Meteorologist. This decision was given effect to in April, 1926.

The principal activities of the Alipore Observatory and Office at present are :—the maintenance of a series of observations by eye readings and by autographic instruments registering pressure, temperature, wind, humidity, etc.; recording earthquakes by a seismograph; supplying tested instruments to all other Observatories of the department; collecting weather logs of steamers arriving at Calcutta for the study of marine meteorology; publication of the

Daily Weather Report for North-East India; supplying time-signals to the Port of Calcutta by dropping Time-balls, and transmitting time-signals by wireless according to the International system twice a day; sending warnings about storms or anticipated heavy rain to a number of railway, public works, police, irrigation and other classes of officers : and, most important of all, the issue of Weather Bulletins and storm warnings by priority telegrams to ports round the Bay of Bengal, and to ships at sea by wireless broadcasts, which are issued at least twice daily, but which, if occasion demand it, are increased to as many as six times during the day and night.

CHAPTER VI.

OTHER EDUCATIONAL INSTITUTIONS IN AND NEAR CALCUTTA

GOVERNMENT COMMERCIAL INSTITUTE, CALCUTTA.

The Institute first took form under the auspices of Presidency College, Calcutta, in 1905 at a time when the problems of Commercial Education had not engaged the serious attention of educationists and business men in most other parts of India. Even to-day, it stands alone in the Province in its character, aims and management.

The Institute affords training of a practical character, vocational enough to be deemed technical, well up-to-date, and capable of direct application to the trade of the City. The subjects taught are approached in an undogmatic way as opposed to the academic methods followed in the Universities and Arts Colleges, the aim being to encourage in the students the growth of a business frame of mind.

There are arrangements for a comprehensive course of study, covering a period of two years, in the Day classes, which are meant for young aspirants to business, who have just left school. The Evening classes offer facilities to those who may have received the necessary preliminary training in the Day classes and have already found employment and who are desirous of bettering their qualifications. There are special arrangements for classes in connection with the training of students for the examinations of the London Institute of Bankers, the Accountancy Diploma Board, Bombay, and those held for recruitment to the Railway Accounts Service.

The Institute follows courses of study carefully prepared under the guidance of the Board; affiliates other commercial institutions in the province; holds its own examinations; and grants its own Diploma.

It is a Government institution controlled by a Board of Management on which the influential section of the Mercantile community, both Indian and European, is fairly represented.

CALCUTTA DEAF AND DUMB SCHOOL.

A class was started in April, 1893 in a small room in the City College at No. 13, Mirzapore Street by the late Mr. Srinath Sinha, which afterwards became the Calcutta Deaf and Dumb School. In May of the same year he was joined by the late Mr. Jamini Nath Banerji and Mr. Mohini Mohon Mozumdar. In 1896 Mr. Banerji was sent to England and America for a thorough training in the art of teaching the deaf. He was the first Principal of the school and served in that capacity till the day of his death in December, 1921. The present position of the school is largely due to his great organising abilities and superior merits as a teacher of the deaf.

The present home of the school at 293, Upper Circular Road was built in 1903. The following gentlemen rendered great services to the school in those difficult days of its infancy, *viz.*, the late Mr. C. W. Bolton, C.S.I., I.C.S., who was the President of the school; the late Mr. Nobin Chand Boral, one of the Vice-Presidents of the school; the late Mr. Umes Chandra Dutt, who was the first Secretary of the school and served the school in that capacity till the day of his death; and the late Principal F. J. Rowe of Presidency College, Calcutta.

The school is managed by an Executive Committee elected by the donors and subscribers to the school. Amongst the benefactors of the school the name of Raja Sarat Chandra Rai Chaudhuri Bahadur of Chanchal, Malda, should be prominently mentioned. He has given to the school an endowment of 2 lakhs, and a donation of Rs. 20,000 towards the cost of an extension to the present buildings.

The school receives a Government grant of Rs. 1,000/- per month and a Calcutta Corporation grant of Rs. 550/- per month.

The Oral Method of Instruction is employed in teaching the students, by which they are taught to speak and understand others speaking by watching the movements of the speakers' lips. The use of Signs is not allowed. Finger-Spelling also is not used.

There is an Industrial Department attached to the school, where the boys are trained in the different crafts. There we find Drawing, Painting, Papier Maché work, Clay-Modelling, Printing, Tailoring, a Machine Shop, Smithy, Carpentry, etc.

There is a Boys' Hostel attached to the school. A Hostel for Girls will also be opened within a very short time. Many of the assistant teachers reside in the Hostels as resident teachers to look after the boarders, and to help them in their studies. There is also a Normal Department to train teachers. Teachers trained in the school have started other schools in different parts of India, such as Dacca, Barisal, Chittagong, Mysore, Baroda, etc.

CALCUTTA BLIND SCHOOL.

This was founded in 1897 with a view :—

- (1) To provide a home for the homeless and helpless blind without any distinction of sex, nationality or religion;
- (2) To impart, as far as practicable, scientific, industrial and literary education to the blind.

The ideal of giving a complete education and training to the pupils, so as to fit them to be self-supporting members of the community, has always been kept in view.

The School has the following five departments :—

A Preparatory School, a Secondary School, a Technical School, a Music School and a Normal Class.

The Course of Instruction is as follows :—

1. Physical Education, including, Gymnastics, Drill, Swimming, Cycling and other Athletic Sports.

As the vitality of the ordinary blind person is said to be about 25 per cent. below that of his sighted compeer, it is essential that careful attention be paid to physical training.

2. General Education includes (i) in the Preparatory Course, Kindergarten, Reading, Writing, Arithmetic, Modelling, Nature Study and Object Lessons; (ii) in the Secondary Course, Literature (English, Hindi, Bengali and Sanskrit), History, Geography, Mathematics, Shorthand and Typewriting. In the Secondary Course, students are prepared for the Matriculation Examination.

3. In the Music School, instruction is given both in vocal and instrumental music. Special attention is paid to those who intend to follow Music as a profession.

4. Technical Education includes manufacturing and repairing of Cane and Bamboo furniture, etc., Coir Mat Weaving, Weaving on looms and the Wool Knitting for the girls.

Manipulation of Carpentry tools is taught to help the pupils in their trade.

5. In the Normal Class, teachers are trained in the latest methods of teaching the blind.

Great attention is always paid to hand-training and development of touch, which is the essential sense and almost the only asset of the blind, without which their training is an impossibility. The pupils also have lessons in learning locality and direction, for the intuitive faculty which guides some children is entirely wanting in others.

Suitable readings from the dailies and periodicals are given every morning and evening, and weekly study groups are held to keep the pupils in touch with the outside world, and to enlighten them on current events and topics.

The School is located in the open country on the Diamond Harbour Road, Behala, 6 miles south of Calcutta. There are spacious residential and school buildings, and large playgrounds. Teachers both in the Boys' and Girls' Departments are in residence and look after the pupils. The Principal and the Superintendent also have their quarters in the compound.

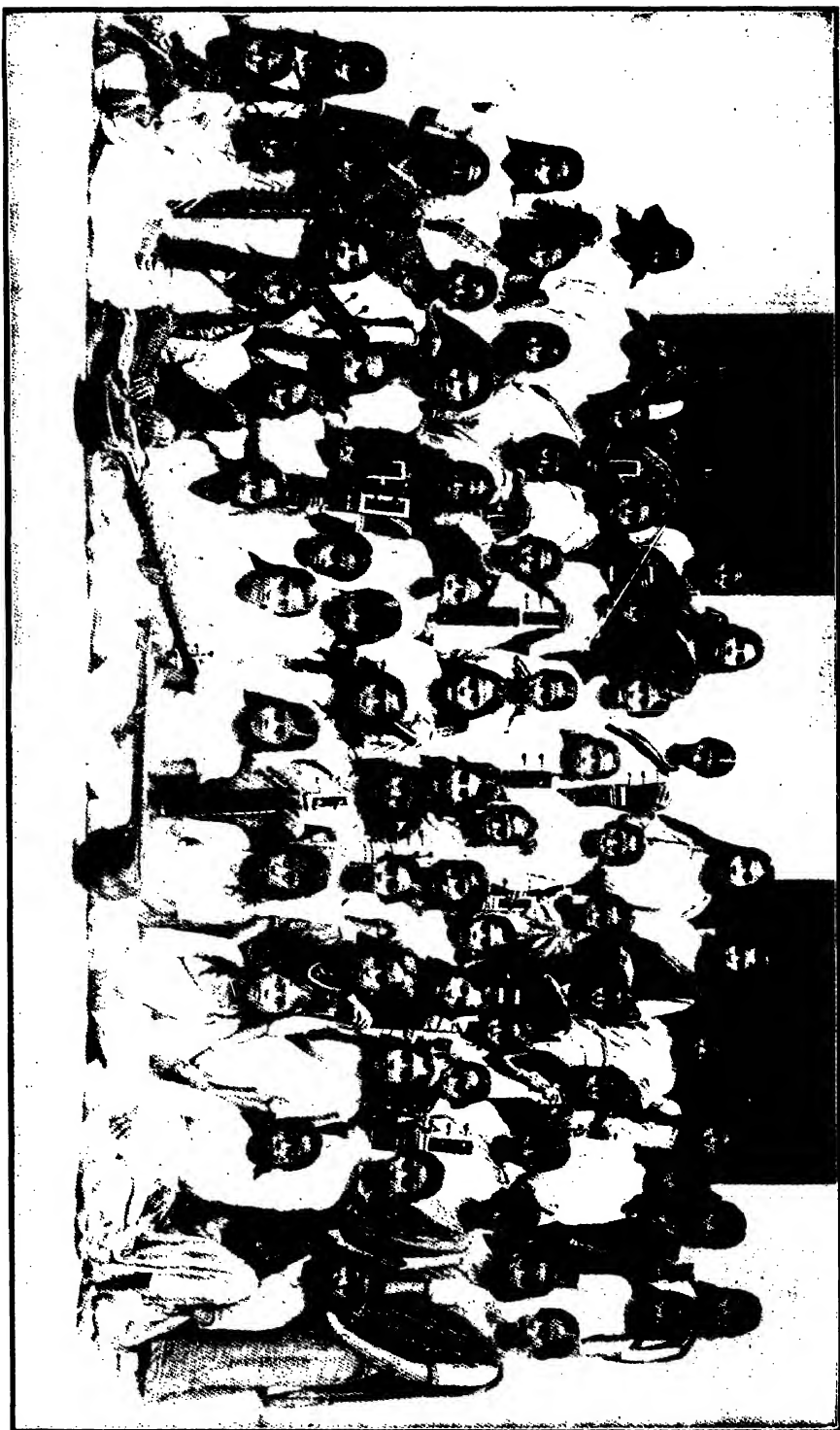
THE CALCUTTA SCHOOL OF MUSIC.

The Calcutta School of Music was founded in 1915 and fills an important place in the musical life of the city. Its headquarters is at 43, Park Mansions, Park Street. A considerable number of pupils pass through it each year, 126 names having been on the roll during 1926-27. Of these the details are as follows :—

Anglo Indian	Armenian	European	Indian	Japanese	Jews
55	3	26	28	1	13

The subjects of study are :—

Singing, Pianoforte, Violin, Viola, Violincello, Wind Instruments, Chamber Music, Orchestra Playing, Theory of Music, Harmony and Counterpoint.



SANGIT SANGHA (STUDENTS).

The School organizes two series of concerts at popular prices each year. Of these six Chamber Concerts are held during the monsoon season, and six Symphony Concerts during the winter months.

SANGIT-SANGHA.

(Conservatoire of Indian Music.)

The Sangit Sangha has now completed the twenty-fifth year of its existence. Founded by the late Sir Asutosh and Lady Prativa Chaudhuri as the "Ananda Sabha" on the Bengali New Year's Day (the 1st of Baisakh) in 1901, it was ten years later reconstructed by them into a public institution under the name of the "Sangit Sangha" on Rakhi Purnima Day (the 30th of Sravan) in 1911. Sin. Prativa Devi resolved to remove the barrier of social prejudice which prevented Indian girls from cultivating one of their charming national arts and to take out of degraded professional hands the culture of our national music.

At that time, there were no institutions for the scientific study of the subject. The class of professional musicians to whom the knowledge and study of the art was confined, was rapidly dying out from want of adequate support. Classical Indian music scarcely attracted, and whatever still remained was getting vulgarized. Prativa Devi's anxious desire was to try and preserve what we still possessed, and to revive what had been lost.

Objects.—The objects of the founders of the institution were set forth by them as follows :—

1. To revive, encourage and popularise the various schools of classical Indian music, instrumental as well as vocal.
2. To promote research into, and collect all available materials for a history of Indian music, and to procure all manuscripts and printed books and symbolic pictures dealing with, or in any way treating of Indian music, as also to recover and publish such ancient Indian songs and musical pieces as may be still available.
3. To establish schools for regular instruction in music, or aid in the formation of such schools.
4. To afford opportunities for occasional lectures on music.

1
5. To adopt a general system of notation adapted to Indian music of all kinds.

6. To award prizes for special skill in vocal and instrumental music.

7. To organise musical entertainments with a view to the gradual development of a taste for the art, and to afford additional means of social recreation.

8. To devise and adopt other means for the encouragement of Indian music in general.

Situation.—The main institution is situated at No. 70, Corporation Street, and there are branches at the Diocesan College, Bethune College, Brahmo Girls' School, Boy Scouts' Headquarters and other educational centres.

Teachers.—Originally, Shyamsundar and Pitumgiri Misra were the teachers. Later, the services of the following musicians of the first rank were secured :—Kaukub and Keramatullah Khan Sahebs and Hafiz Ali Khan (*sarod* players), Imdad Khan Saheb and Inayatullah Khan (*sitar*), Chandrika Dube (*esrar*), Darsan Singh and Masiq Khan (*tabla*), Viswanath Rao, Lachmi Prasad and Sew Sevak Misra (singers). The teaching staff at present includes musicians of repute, such as Sangitacharya Gopeswar Bandopadhaya, Sj. Sitanshujyoti Majumdar, Sj. Bijoy Lal Mukhopadhaya and Mian Waliullah Khan.

Members and Students.—The members and students of the institution, who come from all communities, include almost all the best *amateur* musicians of Bengal. Talented and deserving pupils are taught free or at a concession, and some of them have been trained as teachers.

Charities.—Students of the institution have helped to raise a sum of over Rs. 12,000/- in aid of various charities, by their performances of Rabindranath Tagore's "Valmiki-Prativa" for the relief of wounded Indian Soldiers, "Barsha-Mangal" for Visva-Bharati, and concerts in aid of the Khulna Famine Relief Fund, and of the Deshbandhu Das, Asutosh Mookerjee and Surendra Nath Banerjee Memorial Funds.

Lectures and Recitals.—Under the auspices of the Sangit Sangha's founders, *jatra* has been performed by Sj. Mukundu Das, *kirtan* sung by Pandit Ram Kamal Bhattacharya, and *kathakatha* recited by Hem Chandra Kaviratna. Lectures and discourses on

music have been delivered by S^j. Rabindranath Tagore, S^j. Jogendra Nath Mukherjee, Miss Marie Hall, Mr. S. J. Sarkies, Mr. and Mrs. Percy Brown and Pandit Visnu Digamber; and recitals have been given by famous musicians from different parts of India.

Musical Journal.—A system of notation for Indian music has been popularised by the monthly musical journal of the institution, the "Ananda Sangit Patrika," founded and published for ten years at her own expense by Sm. Prativa Devi.

Library.—A small but valuable collection of books on Indian music have been left by her to form the nucleus of a library for the school.

The splendid record of the Sangit Sangha, in creating an interest in genuine Indian music and in spreading its culture amongst all sections of the community, entitles it to the support of all who have the cause of our national education at heart.

The memory of its Founders remains to be perpetuated by the erection of a permanent habitation for the institution, for which purpose a Building Fund of Rs. 25,000/- has been collected by the present Hony. Secretary, Dr. Asvinikumar Chaudhuri.

SANGIT SAMMILANI.

This is an Association for the cultivation and spread of Indian music on a scientific basis, and was established in 1908 at 74, Dharamtolah Street. Its objects are, (1) to spread and improve the cultivation of vocal and instrumental music (Indian) among the cultured people of Bengal, (2) to effect and maintain improvements in the music schools for girls and boys founded and owned by the *Sangit Sammilani*, (3) to arrange from time to time Soirées and musical entertainments—generally held in March and September, (4) to improve social fellow-feeling by friendly gatherings. The members who take active part in music form the Philharmonic Society which meets on Saturdays (sometimes twice a month only), as it is found convenient to members, from 6 p.m. to 8 p.m.

Present Activities. It is at present running three institutions in Calcutta—(1) one school for girls on Sundays, (2) one for boys on Thursdays: and (3) on Saturdays, or twice a month according to the convenience of the members, the meeting of the Philharmonic Society

takes place. It is formed of those members of the *Sangit Sammilani* who want to cultivate higher music both oriental and occidental.

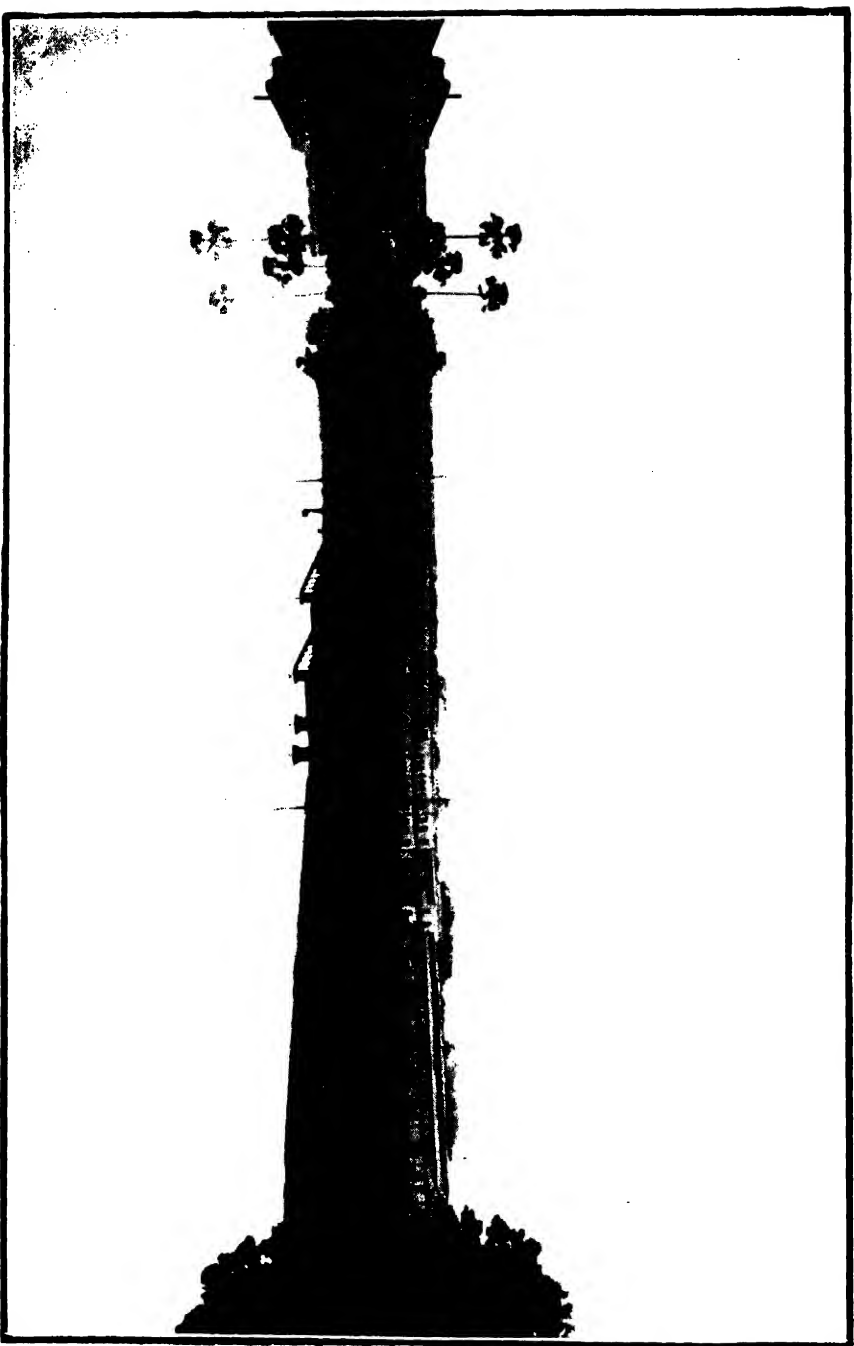
THE SISTER NIVEDITA GIRLS' SCHOOL.

This was started by the late Sister Nivedita under the inspiration of Swami Vivekananda with the object of training little girls and purdah women in the Hindu ideals of womanhood as adjusted to modern conditions. The school provides education free to its students. There is a boarding house attached to it where resident students live with the lady teachers who have dedicated their lives to the cause of education. The building, at 5, Nivedita Lane, Baghbazar, is a fine specimen of Hindu architecture adapted to the modern style.

THE BENGAL TECHNICAL INSTITUTE.

The Bengal Technical Institute was founded in 1906. When started, Mr. T. Palit (afterwards Sir Tarak Nath Palit) was the moving spirit. Subsequently, in 1910, it was amalgamated with the National Council of Education, Bengal, and since then it has been under the control and management of that Body. Sir Rash Behari Ghose was its first President, and he was succeeded in that office by the late Sir Ashutosh Chaudhuri. Sir P. C. Roy is now President. From time to time the office of the Secretary has been filled by some of the most prominent men in Bengal's public life, such as the late Mr. Rasul, Sir Devaprasad Sarvadhicari, the late Sir Ashutosh Chaudhuri and Mr. Fazlul Haq. The present Secretaries are Messrs. H. N. Dutta and B. K. Roy Chowdhury.

In 1922 the National Council of Education was able to secure from the Corporation of Calcutta a fine piece of ground measuring about 100 bighas at Jadavpur on Gariaghata Road, within 5 miles of Sealdah and in the immediate vicinity of the Jadavpur Railway Station, and on that site a big Technical Institute has been built. It contains Workshops with a Power House and Laboratories for Mechanical Engineering, Electrical Engineering, Chemical Engineering and Physics. It has also a central College Building and contains a rich and well-equipped Library. The outlay on these buildings has been Rs. 7,00,000/- and the value of the machinery put up in the Workshops and the Power House is about Rs. 2,00,000.



BENGAL TECHNICAL INSTITUTE.

The equipment of the four laboratories has cost the Council about Rs. 2,50,000. A laboratory building for Chemical Technology is under construction, and machinery for Oil-Technological teaching has been ordered. The building and equipment are estimated to cost Rs. 1,00,000. The books in the library are worth about Rs. 30,000.

The Bengal Technical Institute carries on the following courses :—

A. Four Years' Course in each of the following branches :—

- (1) Mechanical Engineering.
- (2) Electrical Engineering.
- (3) Chemical Engineering.

B. Three Years' Course in Mechanical and Electrical Engineering combined. In this course the rudiments of Engineering theory are taught, most of the students' time being spent in the Workshops, Power House and Drawing-shop.

C. Two Years' Course in Survey and Draftsmanship.

D. The Apprentice Department provides theoretical training mainly for Apprentices employed in Workshops of the Corporation of Calcutta.

The Technical Institute is served by an efficient staff including seven Graduates of the best American, German and British Universities and Technological Institutes, besides some brilliant scholars of Calcutta University and of our Institute; and on an average there is one teacher for every 15 students. The number of students on the rolls is 650. The majority of them are day-scholars, as hostel accommodation is available only for 100 students. Steps are being taken to build at least half a dozen Hostels and to make the institution a residential one. A little over 5 per cent. of the students on the rolls enjoy free Studentships awarded on consideration both of poverty and intelligence.

Students of the Institute hail from all parts of India, and Graduates of the Institute are now to be found in almost all important Factories, Workshops and Industrial organisations. Some have started independent businesses in Calcutta and outside.

The following is a list of the more important donors :—

	Rs.
Sj. Brojendra Kishore Roy Chowdhury ...	5,00,000/-
Late Maharaja Suryyakanta Acharyya Chaudhuri ...	2,50,000/-
„ Subodh Chandra Mallik ...	1,00,000/-
„ Durgadas Bose ...	25,000/-
„ Sir Rashbehari Ghose ...	16,00,000/-
„ Gopal Chandra Sinha ...	1,00,000/-
Total ...	25,75,000/-

In addition to this the Bengal Technical Institute receives an annual Grant-in-aid of Rs. 30,000/- from the Calcutta Corporation.

THE GOVERNMENT WEAVING INSTITUTE, SERAMPORE.

Serampore is the chief town of a Subdivision of the Hooghly district. It is located at a distance of 13 miles from Calcutta, and is easily approached by the East Indian Railway from Howrah or from Sealdah by the Eastern Bengal Railway to Barrackpore and from there by ferry service across the river. Being situated on the Grand Trunk Road, motorists frequently visit the station, for the town is of historical importance and there are many things of interest to be seen. Serampore was at one time considered a health resort of Calcutta and was frequented by week-end visitors from Calcutta and other places. It is an important centre of the Jute and Cotton Mill industries and has, besides, some seven factories where silk dyeing and printing are carried on.

The hand loom weaving industry of Serampore dates back to antiquity. There are reasons to suppose that the industry flourished here about three centuries ago. There were then about 600 weavers at Serampore who carried on their profession with handspun yarns of medium and fine counts on their primitive throw-shuttle looms, and made quite a lucrative business out of it. But times changed, and the artisans found that cotton-weaving would not enable them to make both ends meet. Accordingly they turned their attention to silk weaving, and Serampore soon became one of the chief centres of silk manufacture. Some improvements were effected in the various processes involved and the fabrics were exported to all parts

of India ; but the real great change took place when the Danish settlers made Serampore their home. A Danish gentleman brought with him an improved loom which, it was said, would double the output of the primitive loom. This was the epoch-making fly-shuttle loom which has revolutionised handloom weaving and may well be said to be the salvation of the industry. The gentleman, however, kept the loom locked up in a room to which no one had access. The weavers of the locality grew curious; and one evening, as luck would have it, a local blacksmith was afforded an opportunity of seeing the loom and eventually, he is said to have made the first fly-shuttle slay. This is the story which is narrated and believed at Serampore of the introduction of the first Serampore-made fly-shuttle slay. This was about 150 years ago. The Serampore weavers readily took to the new loom, and they used it for silk weaving and other goods till about 50 years ago, when the silk industry for some reason received a set back. The industry gradually declined, and it is said that Murshidabad during this period captured the trade, especially as the growing of silk was also done there. The Serampore weavers naturally turned their attention to cotton weaving, and this is still done here, as Serampore has become famous in the market for its dhooties and sarees of medium and fine counts. All these cloths are woven on fly-shuttle looms, and the throw-shuttle loom is practically extinct at Serampore.

In the year 1901 a Conference of the Directors of Public Instruction of the various provinces was held at Simla to consider the question of industrial education in India. As a result of their deliberations, the Director of Public Instruction, Bengal, submitted a report proposing that a school should be established for the purpose of giving instruction in up-to-date methods of hand weaving, as, next to agriculture, handloom weaving constituted the most important industry of Bengal. A special Committee was then appointed to institute enquiries into the economic conditions of the handloom industry and the causes of its decline, and to suggest remedial measures. They were unanimous in their opinion that the industry still possessed great vitality and that it could be revived by the introduction of fly-shuttle looms and by instruction in modern methods of weaving. Serampore was selected as the most suitable centre at which operations could be commenced, as it con-

tained a large and intelligent artisan population who had already adopted—

- (i) the fly-shuttle loom which nearly doubles the mechanical efficiency of the primitive loom; and
- (ii) the cage creel, a device, which, at a trifling cost, enables the weaver to lay 50 to 100 warp threads in one operation, in place of the primitive process by which only one or two threads constituting the warp could be dealt with.

Thus the Weaving Institute at Serampore came to be established with the object of giving technical instruction in the best and latest methods of handweaving, of extending a knowledge of the mechanical improvements which make the modern handloom so vastly more effective an instrument than the primitive looms still widely used by the weavers in Bengal and so of strengthening and reviving the weaving industry in this country. With these objects in view two quite distinct grades of instruction are given, forming higher and lower classes—

- (i) to young men of a fair degree of education who may be trained as teachers, managers and organisers of the weaving industry; these form the higher classes.
- (ii) to actual handloom weavers from Serampore and other places; these form the lower, or artisan, classes.

As the scheme was entirely of an experimental nature, it was decided to accommodate the Institute in temporary buildings, and Raja Kishorilal Goswami Bahadur of Serampore very kindly placed one of his buildings at the disposal of Government for the purpose at a nominal rent. Subsequently a piece of land measuring about 14 bighas was also acquired for the location of the permanent buildings of the Institute. Meanwhile the Swadeshi movement of 1905 helped to bring the scheme to a head and contributed to the speedy establishment of the School. In addition to the Institute buildings, there are three hostels attached to the Institute for Hindu, Muhammadan, and Christian boarders, respectively. Each of these hostels is under the supervision of a Superintendent controlled by the Principal, and the health of the students is looked after by the authorities of the Walsh Hospital, Serampore.

The Institute was formally opened in the year 1909 under a Principal (recruited from England), with an Assistant Principal and a small staff. The Institute since the day of its inception has been very popular, and its name is now familiar throughout India with those interested in the handloom weaving industry, as this is the only Institute of its kind where young men of the undergraduate type are trained in the practice and theory of handloom weaving and its allied subjects on the lines of the Manchester College of Technology. The Institute has been so popular that although a new building was rented last year by way of extending the accommodation, over 2,000 applicants had to be refused admission for want of accommodation. On representing the case to the Hon'ble Minister in charge of Agriculture and Industries, he has kindly taken the matter up, and it is hoped that before long permanent buildings for the Institute will be erected at Serampore.

UNIVERSITY OF DACCA.

Dacca, the former Mogul Capital of Bengal, and, more recently, until 1912, Capital of the short lived Province of Eastern Bengal and Assam, is situated in Eastern Bengal about 200 miles N.E. of Calcutta. The University of Dacca was established in 1921 under an Act, passed in 1920, which provides for the constitution of Faculties of Arts, Science, Law, Agriculture and Medicine. It is constituted in its main lines in accordance with the recommendations of a Committee, which sat in 1912 and was presided over by the late Sir Robert Nathan, and of the Calcutta University Commission of 1917-1919, presided over by Sir Michael Sadler. The Report of this Commission states that "two main factors may be clearly distinguished in the origination of the scheme; first and foremost, the desire of the Musalmans of Eastern Bengal to stimulate the educational progress of their community, and secondly, the desire of the Government of India to create a new type of residential and teaching University in India, as opposed the present affiliating type. To these must be added a third factor of special importance, the desire of the Government to relieve the congestion of the University of Calcutta." Although special attention is being devoted to Islamic Studies and to the needs of the Musalman Community, the University remains open to all, without

distinction of sex, race, creed or class. It is a unitary Teaching and Residential University of which the constitution resembles in many respects that of the modern English Universities. The authorities of the University include a Court, an Executive Council, an Academic Council, and Faculties; and the teaching staff has the main responsibility for all matters connected with teaching and examinations. The students (other than those living under specially approved conditions) reside in the Halls and Hostels situated in the University domain, and the University teachers also reside in the houses erected for them thereon. The domain consists of about a square mile of fine park land, including over 100 acres of playing fields. It is adjacent to the Civil Station of Dacca and to the park called the Ramna, and lies from 1 to 1½ miles north-west from the centre of Dacca City. It is provided with electric light and power.

The chief existing buildings for teaching and administrative purposes include: Central Buildings, containing about 200 rooms, with 117,000 sq. feet of floor space, used for class rooms and Library (at present utilised partly as a hostel for Muslim students); Chemical and Physical Laboratories, each including about 1200 sq. feet of floor space; a further building used as an extension of the Chemistry Laboratory, and Club House for members of the University staff; the Curzon Hall (which accommodates about 2000 persons); the Dacca Hall buildings, with residential accommodation for 160 students; and the Jagannath Hall buildings. A residence for Women students has been opened during the session 1926-27, and is attached to the Dacca Hall.

The Library has about 46,000 volumes. The Laboratories include: Physical, with metal and wood workshops; Chemical, with special arrangements for training in commercial analytic methods; and Psychological.

There are three *Faculties*: Arts, Science and Law.

Admission.—The duration of the courses of studies prescribed are as follows; for B.A. or B.Sc. ordinary, 2 years, with Honours, 3 years; M.A. or M.Sc. 2 years, or in the case of a Dacca Honours B.A. or B.Sc. 1 year; B.T. or L.T. 1 year; M.T. 3 years; B.Com. 2 years; B.L. 3 years (Dacca Honours B.A. 2 years); M.L. 3 years. The Ph.D., D.Sc. or D.L. may be taken by graduates of 3 years' standing, but graduates of other Universities must first pursue

researches in this University for 2 years; published research work is required.

Scholarships open to graduates include : 3 of Rs. 40/- p.m. each; 10 of Rs. 32/- p.m.; 1 of Rs. 30/- (for backward classes only); 2 of Rs. 25/- (for Muhammadans only). Research studentships : 2 of Rs. 100/- p.m. and 4 of Rs. 75/- p.m.; and one post-graduate Law scholarship of Rs. 50/- p.m.

Fees. The Tuition fees per session are : for the B.A., B.Sc., or B.L. course, Rs. 96/-; for B.Sc. with Honours in Physics and Chemistry, Rs. 120/-; M.A. Rs. 120/-; M.Sc. Rs. 144/-. Other fees are : Registration Re. 1/-, Admission Rs. 5/-, Athletic Rs. 5/-, Students' Union Rs. 3/-, Research students Rs. 10/-. Seat rent in the Hostels varies from Rs. 2/- to Rs. 4/- p.m., including cost of light, water, medical attendance, medicine and servants. Cost of food comes to about Rs. 12/- p.m.

Tutorial classes have been organised for all the Departments of Study. All the teachers of the University are engaged on the work under the control of the Heads of Departments and the Provosts.

VISVA-BHARATI AND SANTINIKETAN.

A hundred miles away from Calcutta to the North-West is situated Santiniketan, the headquarters of the Visva-Bharati, Dr. Rabindranath Tagore's International University. The Visva-Bharati was formally founded on the 22nd December, 1921. It had, however, grown gradually out of the Santiniketan Asram which is associated with the name of the Poet's father, Maharshi Devendranath Tagore, one of the outstanding spiritual personalities of his time.

The site of the Santiniketan Asram was originally a bare spot, in the middle of open undulating country. Here Maharshi Devendranath came on one of his journeys, and attracted by the place, pitched his tent, and spent his time in meditation and prayer. The Saptaparni trees on that spot are still to be seen, with the open plains stretching out before them to the western horizon, and the marble slab which marks the place is inscribed in Bengali with the text of the Maharshi's meditation—

“He is the repose of my life,
The joy of my heart,
The peace of my spirit.”,

The Maharshi built a house and a temple in this place and dedicated this Asram with an endowment to the public for the use of everyone who wished to meditate on God, free from all antagonism of creed and sect. Thirty years later, Rabindranath Tagore, with the warm approval of his father, founded a boarding school, the Brahma-Vidyalaya, at this place (December, 1901). His immediate object was to build up an institution where children would live a happy and free life and be educated in close touch and harmony with the surroundings of nature. The forest homes of ancient Indian learning had always a special appeal to his mind.

The idea of the Visva-Bharati, a wider cultural centre, was a natural development of the Asram. It took definite shape in 1921, and the Visva-Bharati was registered as a public body in May, 1922, whereupon Rabindranath Tagore made over to it all the funds and properties in use for the institution. The declared object of the Visva-Bharati is to seek to realise in a common fellowship of study the meeting of East and West, and thus, ultimately, to strengthen the fundamental conditions of world peace. To further this object, the Visva-Bharati maintains educational institutions at Santiniketan, and the Institute of Rural Reconstruction at Sriniketan (two miles off from the Asram) with various departments for the practical and vocational training of students.

The residential arrangements for pupils at Santiniketan are under the direct supervision of the teaching staff. The pupils live in small groups with a Housemaster, who is not merely an instructor but also their companion. Girls are accommodated in the Naribhavan—a separate building for them—under the supervision of an experienced Lady Superintendent, and playing grounds have been provided for their exclusive use. Girl students are also given practical training in cooking, needlework, nursing and domestic economy. A whole time qualified doctor is in charge of the Hospital and looks after the health of the students. The pupils get every facility for sports and games.

Education is carried on amidst the peace and beauty of Nature. Classes are held in the open air whenever possible. A special feature is the personal contact between teachers and students. The staff includes many teachers of great experience and high academic distinction. The Library at Santiniketan deserves special mention

for its many valuable collections of works—including generous gifts from Germany, France, Italy, Egypt and different Indian States. There is a good collection of manuscripts, and the Art section is unique in India.

The lowest forms in the school have been organised into the Sishuvibhaga, or the Children's Department, to give free scope to scientific methods of education based on a fuller understanding of child-psychology. 'Learning by doing' may briefly express the method that is attempted. A careful study of the instincts and interests of the children, by competent trained teachers, serves as the starting point of their instruction.

The higher forms and the College classes have been combined into the Sikshavibhaga. By special arrangement with the University of Calcutta students are coached and prepared for the examinations of that University. Those who do not go up for the Calcutta University examinations may study for the Visva-Bharati Diploma.

The Vidyabhavan is the Institute of Research, maintained for advanced students who desire to work in an atmosphere of quiet and learning. Besides a strong group of resident Professors, an eminent scholar comes every year from abroad as Visiting Professor. Drs. Sylvain Levi, Winternitz, Sten Konow and Formichi have stayed at Santiniketan in this capacity.

The Kalabhavan, or the School of Arts and Crafts, is a great feature of Santiniketan. A School of Indian painting is developing here under the direction of eminent artists, and students flock to it from every part of India. Education in Music is not neglected, and attention is given to the instruction of students in instrumental music as well as singing.

Sriniketan is the centre of the Institute of Rural Reconstruction, which is now attracting much attention in this country. There are various departments at this centre, doing a great deal of useful work. The Agricultural Station undertakes various experiments for the benefit of the cultivators around, and apprentices are taken from different districts. The Bengal Government Agricultural Department has undertaken the management of the mulberry plantation and the rearing of silkworms. The Poultry and Dairy departments are developing rapidly. The Tannery trains the local leather workers in the art of improved tanning, and for starting business

on the co-operative basis. The Weaving department has trained 138 students in four years—many of them being teachers in the schools of the district. Teachers trained here have started weaving in 25 different centres.

Village work is a very important part of the activities of the Institute. Public Health propaganda is carried on by systematic lantern lectures. Volunteers attend to sanitation work in the neighbouring fairs. Health societies have been organised to fight malaria, and their work is regularly supervised. A Dispensary with an attached clinical laboratory has been opened. Prospective village workers are periodically gathered in Training Camps and are taught first aid, processes of disinfection, and preventive work. Brati-Balaka organisations, or Boy Scout Troops, have been started among the village boys. The Institute has established a Girls' School, a Circulating Library and many Night Schools for the depressed classes. Among its most recent activities may be mentioned the publication of a complete economic and social Survey of the village of Ballavpur, and similar work has been begun in other villages. Finally, the Sikshasatra is an interesting educational experiment. It is a school in which pupils are taught to do their own work while receiving as far as practicable the elements of an all-round education.

CHAPTER VII.

(1) PUBLIC ADMINISTRATION IN CALCUTTA.

THE CALCUTTA CORPORATION.

The Calcutta Corporation, in which is vested the Civic Administration of the City, is an old body which was remodelled by an Act passed by the Bengal Legislative Council in 1923. The new Corporation is composed of eighty-five Councillors, of whom ten are appointed by the Bengal Government and seventy-five elected by the rate payers and privileged public bodies. Five Aldermen are elected by these Councillors, as also are the Mayor and the Deputy Mayor who hold office for a year at a time. The Corporation appoints, for carrying out its regular work, a Chief Executive Officer who is authorised to act on behalf of the Corporation in whatever capacity the Corporation may decide.

The election of Councillors is carried out in the following way : Calcutta is divided into 32 General constituencies and some Commercial constituencies. The Territorial constituencies coincide with the thirty-two wards into which Calcutta is divided for purposes of administration. Women have now been given the franchise and generally use it to practical purpose.

The Calcutta Corporation runs a Waterworks Department which is remarkable for its huge Reservoir Tank at Talla in the northern part of the City. It is the second largest of its kind in the world.

The population of Municipal Calcutta is 1,007,264. The income from rates and taxes was Rs. 1,57,78,474 in 1924-25. From other sources, including Loans, a further sum of Rs. 1,43,96,801 was realised in the same year. The incidence of the rates and taxes per head of population was Rs. 14-10-4 only. This compares well with Bombay's incidence per head of Rs. 22-10-9 and Rangoon's Rs. 14-13-1; but badly with that of Madras Rs. 9-1-0, with Delhi's Rs. 5-2-2, and Bangalore's Rs. 3-5-0.

The expenditure of the Corporation for 1924-25 was Rs. 3,05,16,744.

THE PORT COMMISSIONERS.

The Port Commissioners were instituted in 1870, and the modern improvements of the Port have been mostly effected by this Body. At present it includes a Chairman, a Deputy-Chairman, and fourteen Commissioners, nine of whom are elected and five nominated. The Port Commissioners control the Docks and Jetties, and many landing stages or ghats. They also run an efficient Ferry Service to many important places in and out of Calcutta and Howrah. The Ferry Service carries over 10 million passengers annually.

CALCUTTA IMPROVEMENT TRUST.

The Calcutta Improvement Trust was formed in January, 1912. The idea was to make arrangements for undertaking, on a large and long-drawn-out scale, the improvement of the City by opening up congested areas, laying out or improving roads, providing open spaces as "Lungs" of the City, creating good and cheap housing for the poor, carrying Calcutta's limits farther afield by road building, etc.

The Trust has done very good work since its inauguration. It is remarkable how they have 'changed the face' of Calcutta by laying out broad streets like the Central Avenue, New Park Street, New Theatre Road, Russa Road extension, etc. They have also given Calcutta many new Parks, and demolished many a hotbed of congestion, dirt and disease. A study of the various proposed and finished schemes of the Improvement Trust will provide a lesson in Modern Town Planning.

(2) HEALTH STATISTICS.

The Health of Calcutta can be judged on a comparative basis from the following table showing deaths per mille of population per annum in some of the important cities of India. As has been said elsewhere, the death rate is no index of health, especially for a City composed mostly of a semi-floating population. However, considered along with other facts and figures, it gives a general idea.

Deaths—Ratio per mille.

City	1915	1916	1919	1922	1923	1924
Madras ...	36.4	34.9	53.1	43.1	38.0	41.9
Bombay ...	24.17	30.78	70.52	32.13	32.74	33.44
Calcutta ...	28.55	24.66	42.2	29.1	28.4	29.6
Agra ...	28.48	41.39	42.09	35.91	38.20	41.97
Lahore ...	33.59	36.47	34.03	26.35	34.11	45.06
Delhi ...	34.16	38.88	46.40	28.43	42.89	30.54
Darjeeling ...	16.46	15.15	19.3	19.3	18.3	19.4

The above figures show that though the death rate is very high in Calcutta compared to that of a health station like Darjeeling, Calcutta's position among other cities of the same status and position is by no means very bad. Considering the fact that Calcutta is in the heart of malaria-stricken Bengal, this speaks very much in favour of the healthiness of the City. This is largely due to the fact that Calcutta's Water Supply and Conservancy are fairly good. Also, being the home of a large educated community, the average standard of living is better than what it is elsewhere. Moreover, in density of population, Calcutta is somewhat better off than many other cities.

A good idea of the Health condition of the City can be had from the records of the various hospitals showing the number of cases treated for different diseases. A table compiled from these records of 1924 would be as follows.

Disease	Cases treated (outdoor)	Cases treated (indoor)	Deaths (among indoor patients)
Cholera ...	48,975	9,436	2,006
Dysentery ...	717,946	121,492	2,900
Gonorrhoea ...	201,778	31,670	40
Malaria ...	7,698,856	1,037,376	2,074
Rheumatic fever and Rheumatism ...	788,524	85,359	106
Small Pox ...	5,538	5,086	751
Syphilis ...	236,939	49,116	340
Tubercle of the Lung ...	66,285	21,699	3,410
Tubercle (other) ...	38,893	15,994	840
Animal Parasites ...	937,161	82,735	241
Beri Beri ...	4,361	1,019	108
Nervous diseases ...	949,626	103,953	1,237
Diseases of the Eye ...	4,181,260	416,971	56

Disease	Cases treated (Outdoor)	Cases treated (Indoor)	Deaths (among Indoor patients)
Diseases of the Ear ...	2,481,713	202,413	44
Respiratory Diseases (ex- cept Pneu- monia and Phthisis) ...	2,783,963	258,139	1,237
Dyspepsia ...	1,297,390	131,608	313
Diarrhoea ...	1,228,387	150,709	2,467
Liver Diseases	213,000 (appx.)	36,000 (appx.)	1,000 (appx.).
Other Digestive Diseases ...	4,060,371	294,415	1,648
Ulcers ...	2,849,312	245,891	489
Other Skin Diseases ...	3,617,341	406,215	137
Injuries ...	2,013,287	234,949	5,017
Labour ...	37,000 (appx. all cases)		1,000

The largest number of cases are therefore of Malaria and of Digestive diseases. Eye, Skin and Ear troubles account for most other cases. Digestive diseases, as well as Tuberculosis, prove most fatal.

There is plenty to do in Calcutta regarding the supply of pure food, good dwellings, Conservancy, etc.; but rapid progress is being made in these departments. The progressive interest that Government is taking in matters of health means well for the future of Bengal as well as of Calcutta.

(3) PARKS AND OPEN SPACES.

The Maidan, or the large open area round the Fort, is Calcutta's glory. It is a great Park, dotted with areas allotted to Clubs, and intersected by broad avenues, which stretches for 2 miles in length and over a mile in breadth. As a 'lung' for the City, it can compare with Hyde Park in London or the Bois de Boulogne in Paris. The Maidan holds Calcutta's Race-course. It also contains most of Calcutta's numerous monuments. It is a constant source of pleasure and health to the citizens who play in it, walk in it, ride in it or just sit quietly under one of the numerous clumps of trees, enjoying the clear air and sunshine in winter, and the cool sea-breeze in summer. The Red Road (further south, the Casuarina Avenue and

the Kidderpore Road) crosses the Maidan from north to south, extending from the south of Government House as far as Kidderpore Bridge. The Red Road provides the best drive as well as the best walk in Calcutta, and is loved by rich and poor alike.

The Eden Gardens were named after the Misses Eden, sisters of Lord Auckland, Governor-General of India (1836-42), and were laid out mainly owing to their efforts. These Gardens lie between Government House and the River, and contain many beautiful walks, a large artificial lake, and the extensive grounds of the Calcutta Cricket Club. A Burmese Pagoda, removed from Prome after the war of 1854, is also to be found in the Eden Gardens. There is a fine Bandstand, and music is played there occasionally. There is also a ride for the use of equestrians.

Dalhousie Square was at one time the heart of Calcutta. The old Fort William was built close to its western end; and the site of the so-called 'Black Hole', with its Marble monument, may be seen on its north-western side. Round the fine tank of Dalhousie Square is a fine gravel walk, and the whole is enclosed in a beautiful Park containing flower beds, trees and green stretches. The General Post Office, Writers' Buildings, the Dalhousie Institute and many other palatial buildings are built on the roads round this Square. It is the centre of Calcutta's business world to-day.

Calcutta has many other Parks, among which Beadon Square, College Square, Cornwallis Square, Wellington Square, Rawdon Square, Woodburn Park, Ballygunge Maidan, Northern Park, Marcus Square, Shambazar Park and the proposed Southern and Eastern Parks may be mentioned.

(4) RECREATIONS.

Calcutta is one of the biggest sporting centres in the East. The number of sporting clubs in the city, the numerous play grounds, the many tournaments and championships, all point to the enthusiasm that Calcutta feels for sports of every kind.

Among outdoor games, Association Football, Cricket, Hockey and Tennis are the most popular. Golf, Polo and Rugby football are played by a limited number of people, who are mostly Europeans. The Calcutta Friends Club, the Mohun Magan Club, The Customs Club, The East Bengal Club, and Regimental teams from the Fort

and other stations, provide the best Association Football in the City. Mohun Bagan, a Bengali Club, play football barefooted, but extremely well. Their successes against heavier and booted European teams have ever evoked the admiration of all sportsmen. The Calcutta Football Club is probably the finest non-military amateur football team in India, and many an Oxford and Cambridge Blue has added fresh glory to his name as member of the C. F. C. The Calcutta Football League and the I. F. A. Challenge Shield Tournament are the most important Football events in Calcutta.

Cricket is very popular in Calcutta, and nothing attracts a more appreciative and critical crowd to the playing fields than a good Cricket match; though, of course, football crowds far out number any other crowd because of the popular and exciting nature of the game. The Calcutta Cricket Club, which has a very fine ground inside the Eden Gardens, is by far the best Cricket Club in Calcutta. Though occasionally a picked eleven, bearing the name and spending the money of some Raja, Maharaja or similar grandee, might outshine the C. C. C., yet, for sustained quality, there is hardly any team which can beat our City team. The standard of Indian Cricket in Calcutta is unfortunately not very high, though recently a set of younger players have been showing signs of real cricketing talent. It may therefore be hoped that in the near future Bengalis will show as great proficiency in Cricket as they have shown in Association Football. The Mohun Bagan, the Sporting Union, and the Aryans are the most prominent Indian Cricket Clubs of the City.

The Beighton Hockey Tournament is the biggest Hockey event in Calcutta. Some of the local teams, such as the Customs, the Greer Sporting, the C. F. C., etc., are really good teams; but, generally, teams from up-country are far better players, and generally get the better of Calcutta teams. The Bengal Young Men's Association, Lucknow, a Bengali team composed of Lucknow dwellers, has made a name for itself in Calcutta Hockey, as well as elsewhere in India.

Tennis is extremely popular in Calcutta. There are numerous Tennis Clubs all over the City, and the courts of the Calcutta Cricket Club, the Calcutta South Club, and the Calcutta North Club are the scenes of the best tennis played in Calcutta. The first mentioned

club also plays the host to the Bengal Lawn Tennis Tournament which comes off in January. In this Tournament players of repute from all over India assemble to compete for honours. Names such as those of the Dean Brothers, Shimidzu, Kishen Prasad and Okamoto are closely associated with the history of this Tournament. Within recent years the Calcutta South Club Tournament has also made a name for itself. This tournament is played off in December on the South Club courts, and the honours are competed for by high-class players.

Calcutta has several fine Golf Clubs, the Royal Calcutta Golf Club and the Tollygunge Club being the leading ones. Golf events are also organised in Calcutta, and the popularity of this ancient Scottish game is on the increase.

The Royal Calcutta Turf Club Race Course on the Maidan is the finest in India (except, possibly, for the new Course at Barrackpore). On this course are run some of the Turf "Classics" of India, *e.g.*, the King-Emperor's Cup, the Viceroy's Cup, etc.

Boxing is becoming very popular in Calcutta. Bouts are very often arranged at the Globe and the Empire Theatres, and, in winter, at 'King Carnival.' Bengali boys are increasingly going in for this manly sport, and several of them have already fought successfully in the Ring.

Swimming is a highly popular form of sport in Calcutta. Not a tank exists in Calcutta but has a Swimming Club attached to it. The College Square and Cornwallis Square tanks accommodate more than one club. The Calcutta Swimming Championship events show a larger number of entries every year, not excepting even such events as 30-and 20-mile races. Generally speaking, Bengali boys hold their own very well in Swimming. Whether in Water Polo, High Diving, or speed and endurance events, they generally collect all or most of the prizes for themselves.

CINEMAS, THEATRES, ETC.

Calcutta's Cinemas, Theatres, Dances, Concerts, etc., provide one so inclined with endless amusement. The Elphinstone Picture Palace, the Madan Theatre, the Globe Theatre and the Picture House are the best Cinemas. The Empire Theatre, the Art Theatre,

and the Natya Mandir are the leading Theatres, the last two being Indian and the former giving European Variety performances. The Dalhousie Institute Concerts, which take place every now and then, the Symphony Concerts of the Calcutta School of Music in the winter season, and the dances at the Grand Hotel and at Firpo's Restaurant are also highly popular with Europeans in Calcutta.

CHAPTER VIII. THE ROMANCE OF TRADE.

TRADE.

The importance of Calcutta as a trade-centre can be very well understood from the following comparative figures showing the value of the total export and import trade of the principal Ports of India.

Port	Pre-War Average	War Average	1922—23	1923—24	1924—25
	Rs.	Rs.	Rs.	Rs.	Rs.
Bombay	1,45,45,00,000	1,58,37,00,000	2,75,09,00,000	2,75,63,00,000	2,57,21,00,000
Calcutta	1,59,18,00,000	1,62,50,00,000	2,29,78,00,000	2,38,21,00,000	2,64,10,00,000
Rangoon	48,96,00,000	51,54,00,000	89,90,00,000	84,29,00,000	89,90,00,000
Karachi	47,87,00,000	46,88,00,000	64,52,00,000	84,11,00,000	1,06,07,00,000
Madras	19,61,00,000	21,15,00,000	36,35,00,000	38,33,00,000	42,11,00,000
Cochin	6,28,00,000	5,60,00,000	9,67,00,000	10,37,00,000	10,46,00,000
Tuticorin	7,23,00,000	7,55,00,000	10,15,00,000	12,55,00,000	13,12,00,000
Chittagong	7,47,00,000	6,93,00,000	9,82,00,000	1,18,20,000	14,08,00,000

Of Calcutta's trade, slightly more than two-thirds are Exports and a little less than one-third Imports. This excess of exports over imports is a characteristic also of the Ports of Bombay, Rangoon, Karachi, Cochin, Tuticorin and Chittagong. Madras alone of the leading Sea ports in India shows more imports than exports. This is probably due to the fact that though the Madras Presidency consumes a good deal of manufactured foreign goods which can be easily landed in Madras, the peculiar and defective approach of the Port makes it rather difficult to load big steamers with heavy raw materials.

The following table, showing in abstract the Tonnage handled at the Port of Calcutta during 1925-26 and 1926-27, will give a clearer idea of the extensive trade of Calcutta.

		Tons 1925-26.	Tons 1926-27.
Imports	...	2,525,478	2,545,812
Exports	...	5,055,355	5,565,032

The Shipping arriving in Calcutta during these years were as follows :

		1925-26	1926-27.
Gross Tonnage	...	6,453,982	6,972,426
Net Tonnage	...	3,887,560	4,175,204

The articles which chiefly compose the imports and exports of Calcutta are the following :

IMPORTS.	EXPORTS.
Cotton Goods.	Jute.
Metals.	Tea.
Oils.	Grains.
Petrol.	Pulses.
Machinery.	Oil Seeds.
Salt.	Shellac.
Railway Material.	Hides and Skins.
Motor Cars.	Manganese.
Paper.	Pig Iron.
Hardware.	Coal.
Provisions, and Sugar.	

INDUSTRY.

In the 1921 Census, Calcutta was found to contain 1007 industrial concerns employing not less than 10 employees each. The number of workers engaged in these factories, workshops, mills, etc., was 142,276 males and 12,614 females. This number falls a little short of the number showing persons who returned themselves as employés in industry. This, however can be explained by the fact that many such persons were workers in factories employing less than 10 persons and were thus excluded from the first calculation. The following list presents an analysis of Industrial Concerns and their employés.

Nature of Concern.		Number of Concerns.	Male Employés.	Female Employés
Textile and connected Industries	...	77	57,655	10,452
Leather Industries	...	27	1,484	100
Wood Industries	...	47	1,595	8
Metal Industries	...	121	25,647	100
Glass and Earthenware Industries	...	27	2,933	573
Chemical Products	...	153	7,107	493
Food Industries	...	100	4,129	729
Dress Making, etc.	...	109	2,305	5
Furniture	...	18	819	8
Building Industries	...	18	757	37
Workshops	...	62	20,146	27
Power	...	12	2,451	26
Luxury Trades	...	236	15,248	56

Among textiles, Jute is the most important industry and employs 47,275 males and 9,039 females. The compilers of this Guide Book regret that as no Jute firm replied to their invitation to supply material for publication, very little information regarding the Jute Industry can be given. The importance of the Industry may, however, be realised from the facts that, in 1923-24, there were, in India, altogether 89 Jute Mills with a capital of upwards of 24 crores of rupees, or £19 million sterling : while the value of raw Jute exported was more than 29 crores of rupees and of manufactured Jute over 51 crores. It may be added that the year 1928 marks the Centenary of the Industry.

Cotton spinning and weaving employed 5187 males and 1088 females.

The Coal and Iron Companies, of which the offices are in Calcutta, mostly have Mines and Works in the Ranigunge area which lies about 4 or 5 hours' journey away from Calcutta.

Calcutta has many Factories, situated as shown below :

Paint.—Three works, the Shalimar Paint Works being the largest.

Paper.—Titaghur and Bengal Paper Mills at Titaghur and Ranigunge.

Pottery.—Calcutta Pottery Works in Tangra Road, Entally, Calcutta.

Stone.—The Indian Patent Stone Works in Calcutta.

Munitions.—Government Gun and Shell Factory at Dum Dum, and Rifle Factory at Ichapur.

Gas.—The Oriental Gas Co. of Calcutta supplies the entire City with gas, including supplies to the Corporation for street lighting. Their plant at Canal Road East is a place worth seeing.

Electricity.—A detailed account of the Calcutta Electric Supply Corporation's Works will be found below.

Rope.—Four factories, in and near Calcutta.

Gramophone Records.—The Gramophone Co., Ltd., Beliaghata Road.

Matches.—The Western Indian Match Co. at Canal Road, and several other smaller factories. This is a Protected and growing industry.

Ice.—The Lightfoot Refrigeration Co., and The Calcutta Ice Factory are the largest.

Biscuits.—The Britannia Biscuit Factory is an Indian Concern. It is located at Dum Dum.

Oil and Rice Mills.—There are numerous Oil and Rice Mills scattered all over the Northern part of the City. With one exception, they are all Indian owned and managed.

Engineering.—There are many Engineering Works of which Jessop's, Martin's and Burn's are the largest.

Tanneries.—The National Tannery, the Bengal Tanneries, the India Tanneries, the India Leather Manufacturing Co. and many others make Calcutta a stronghold of the Leather Industry.

There are also many Chemical Works, Electro-platers, Goldsmiths, Umbrella makers, Glass blowers, etc.

The *Press* is very well represented. The following well-known papers are published in Calcutta :

Dailies.

Statesman.
Englishman.
Bengalee.
Amrita Bazar Patrika.
Forward.
Basumati.
Basumati (in Bengali).
Ananda Bazar Patrika (in Bengali)
Etc.

Weeklies.

Capital.
Commerce.
Calcutta Commercial Gazette.
Calcutta Exchange Gazette.
Weekly Notes.
Basumati (Bengali).
Atma-Sakti (Bengali).
Etc.

Monthlies.

Modern Review.
Anglo-Indian Review.
Industry.
Calcutta Review.
Prabasi (Bengali).
Bharat-Barsha (Bengali).
Basumati (Bengali).
Bangabani (Bengali).
Vichitra (Bengali).
Sabuj Patra (Bengali).

Others.

Indian Historical Quarterly.
Visva-Bharati Quarterly.
Hindusthan Review.
Journal and Memoirs of the Asiatic Society of Bengal.

Detailed accounts of some of the most important Factories and Works are appended below.

THE BENGAL LUXMI COTTON MILLS LIMITED.

The Mill is situated at Serampore at a distance of about 13 miles from Calcutta, within two miles of the Railway station of Rishra on the E. I. Ry. line. It is almost on the Grand Trunk Road and approachable from Calcutta by motor car.

It is a Limited concern, being the property of about 6,000 share-holders who are all Bengalees, except a few who are Indians of other Provinces. Rai Satish Chandra Chaudhury Bahadur and Mr. Sachchidananda Bhattacharjee are its present Managing Agents. Previously the Mill passed through many hands. It was first established in 1894, in the name of the Bengal Spinning & Weaving Co., Limited. It was opened by Sir Comer Petheram, the then Chief Justice of Bengal. Messrs. Visram Ebrahim & Co. were appointed its first Managing Agents: but as they failed to manage the business properly the Mill was transferred to a body of European Merchants in 1897, under the management of Messrs. Shaw Wallace & Co. The name of the Mill was changed to the Serampore Cotton Mills Limited; but soon the Mill was again in liquidation. It was eventually purchased by Messrs. Mulraj Gobardhandass & Co. of Bombay, who changed the name of the Mill to Luxmi Tulsi Mills: but still the Mill did not prosper.

At this time the Swadeshi Movement was in its full swing and, as an embodiment of the spirit of constructive nationalism, a Company was floated in 1906 by the leaders of Bengal, in the name of the Bengal Luxmi Cotton Mills Limited, to remove the want of a Bengalee concern for spinning and weaving by purchasing the Mill from the then proprietors.

Unfortunately it has lately passed through a very bad time so that, as a consequence, the Mill was about to be put into liquidation when the present Managing Agents came forward to save it from complete ruin. They have invested several lakhs of rupees in the Mill, and it is now working with re-doubled energy.

There are altogether 725 looms and 36,000 spindles in the Mill at present. Under the new management, the production has increased by about 15 per cent. of its previous output. 8,000 lbs. of cloth and Arrangements are being made to replace the existing steam-power by 11,000 lbs. of yarn are being produced on the average every day.

electric power, on completion of which the Managing Agents expect to increase the output by another 15 per cent.

INDIAN IRON AND STEEL CO., LTD.

The Company possesses its own Iron Ore, Coal and Limestone mines within easy reach of the Works, which latter are situated in the fork made by the Bengal Nagpur Railway and the East Indian Railway at their junction at Asansol, Bengal, 132 miles N.W. of Calcutta.

The Works is connected to the East Indian Railway main line at Borachuck Station and to the Bengal Nagpur Railway at Burnpur Station by broad gauge sidings and extensive traffic exchange yards; this is an unique position and provides very special facilities for handling large quantities of material to and from the Works.

The layout of the completed plant provides for the ultimate installation of eight Blast Furnaces of 350—500 ton capacity with sufficient bye-product Coke plant capacity to provide fuel for these furnaces.

The Works, the Indian and European residential stations, water works, etc., cover an area of over 4,000 acres of land.

Iron Ore Deposits.

The Company possesses mining leases from the Government of India over nearly ten square miles in the new Iron Ore field in the Singbhum district of the Chota Nagpur Division, Bihar and Orissa, which is connected by a broad gauge railway with the main line of the Bengal Nagpur Railway.

An average analysis of the ore can be taken as :—

Iron	...	...	...	64 per cent.
Phosphorus	...	... under	...	.06 „ „
Manganese	...	...	...	.05 „ „
Sulphur	...	... under	...	.03 „ „

Limestone.

The Company's property covers an area of 581 acres and is situated at Guttitnagar in the Gangpur State. This State adjoins the Singbhum district, and the limestone quarries are within easy reach of the Bengal Nagpur Railway.

Coal Properties.

These properties are situated in the Jherriah coal field, Bihar and Orissa, and contain large reserves of coal, in an area of 900 acres.

The whole plant has been arranged and designed to deal with very large quantities of material expeditiously, and this is accomplished by having all raw material and finished products handled solely by mechanical means.

Blast Furnace Plant.

The first two furnaces built are of the most modern design, mechanically charged and fitted with revolving distributors for distributing the charge; each furnace has a capacity of 350 tons daily, but provision has been made to increase the capacity to 500 tons if required. Each furnace has a hot blast stove installation of five two-pass side combustion type stoves 25 feet diameter and 95 feet high, and a dust-catcher and two centrifugal dust separators. Provision has also been made to instal a dry dust cleaning system at a later date.

For handling the hot metal from the furnaces 75-ton capacity ladles have been provided, and these ladles convey the hot metal to the double strand pig casting machines, or to the sand cast pig bed, equipped with overhead electric crane and lifting magnet for handling the pig iron.

For the disposal of the slag, 20-ton side-tipping and 15-ton end-tipping slag ladles have been provided.

The Boiler plant consists of six Babcock & Wilcox boilers fired by blast furnace gas, each having 4,510 square feet heating surface, constructed for a working pressure of 200 lbs. per square inch, fitted with integral superheaters and capable of an evaporation of 75,000 lbs. of water per hour, with one boiler spare.

The blowing plant comprises two C. A. Parsons steam Turbo-Blowers, each with an economical output of 40,000 c.ft. of free air per minute at a pressure of 14 lbs. and a maximum output of 36,000 c.ft. of free air per minute at a pressure of 23.5 lbs. The turbine is the high pressure full reaction type, designed for working with steam at a pressure of 185 lbs. per square inch.

Coke Oven and Bye-Product Plant.

Two batteries, each of 80 Simon Carves horizontal flue waste heat ovens, capable of producing 1,000 tons of coke per day, provide all the coke necessary for the first two blast furnaces.

The ovens are filled by electrically driven coal charging cars; and combined leveller and coke rams, also electrically driven, are provided for levelling the charge and for discharging the coke. The hot coke is discharged on to inclined bottom coke cars which are hauled by electric locomotives to quenching stations adjoining the ovens, and the quenched coke is then discharged from the cars by gravitation on to a short inclined coke bench. A belt conveyer at the bottom of the bench takes the coke to a screening house where it passes over screens into railway trucks. The breeze passes through the screens into hoppers fixed below from where it is filled into waggons. The system of coke handling is especially adapted for rapid operation, and is designed with a view to dealing with very large quantities of coke.

The recovery of the bye-products Tar and Sulphate of Ammonia is effected on the Direct Recovery system with serpentine gas cooling apparatus. The plant is guaranteed to be capable of recovering 99 per cent. of the total tar and 98 per cent. of the total ammonia (as sulphate of ammonia) in the gas.

Arrangements have been made so that a Benzol recovery plant can be added at any time.

In connection with the Bye-Product recovery plant, a Sulphuric Acid plant capable of producing 18 tons of 80 per cent. Acid per day from natural sulphur is installed.

Electric Power Plant.

Owing to the Company's undertaking to supply power to other companies, generated from its waste gases, the present Power House building has been made large enough to accommodate four Turbo-Alternator Sets, although at present only two 3,000 KW sets are in operation. An auxiliary D.C. lighting set of 150 K.W. has also been installed to provide for works and bungalow lighting when the large sets are not running.

The turbine is the Westinghouse Rateau high pressure type, and drives a Westinghouse alternating current type generator. The necessary steam for driving the turbines is obtained from a battery of ten Babcock & Wilcox patent water-tube boilers, arranged for firing with waste heat from the coke ovens and with surplus gas, each having a heating surface of 5,246 square feet, constructed for a working pressure of 200 lbs. per square inch and complete with integral superheaters of sufficient heating surface to add 150° F. of superheat to the steam generated by the boilers.

Sundry Plant.

A large up-to-date Machine Shop, Foundry, and Blacksmith Shop have been installed, principally for maintenance of plant; but a quantity of castings can also be undertaken for sale.

Water Supply.

The necessary circulating water for the Turbo-Blowers, Turbo-Alternators, Blast Furnace plant and Works general water requirements is pumped by electrically driven pumps from a large reservoir in the Works area containing approximately 300,000,000 gallons of water, and water for the reservoir is pumped from the Damudar river—a distance of $2\frac{1}{2}$ miles from the Works—by two electric pumps, each capable of pumping 60,000 gallons per hour.

The river-side pumping station also supplies 20,000 gallons per hour to the Water Works for supply of filtered water to the town and residential station.

TITAGHUR PAPER MILLS LTD.

This Company was first established in the year 1882, and manufactures pulp and paper, the main source being sabai grass; but experimental bamboo plant has been erected and bamboo will most probably become one of the main sources of supply for paper manufacture in the future.

The Company owns two mills—one a four-machine mill at Titaghur, and No. 2 mill at Kankinara, also a four-machine mill.

The two mills are equipped to produce 18,000 to 20,000 tons of paper of all varieties annually. No. 1 Mill, Titaghur, has a modern Electrolytic bleach-making plant which supplies the necessary bleaching fluid for both mills. The principal qualities of paper produced by the mills are :—

White and Coloured Printing, Cream laid and Writing,
Brown and White Cartridge, Bank, Blotting, Antique
Wove and Laid, Imitation Art and Badami.

The Managing Agents are F. W. Heilgers & Co., Chartered Bank Buildings, Calcutta.

THE CALCUTTA ELECTRIC SUPPLY CORPORATION, LTD.

In the year 1895 the Government of Bengal passed the Calcutta Electric Lighting Act. Shortly after the passing of this Act an application was made to Government for a License, and on the 7th January, 1897, "The Indian Electric Company, Ltd." was formed to take over the Calcutta Electric Lighting License, 1896, which had been granted by Government.

This first License was for a period of 21 years from the 29th December, 1896 and covered an area of 5.64 square miles. At the time, 21 years was the longest period for which a License could be granted under the Act.

The Indian Electric Company was registered in London with a nominal Capital of £1,000, but in February, 1897 it was resolved to change the name of the Company to "The Calcutta Electric Supply Corporation Ltd." and to increase the Capital to £100,000. A prospectus was issued in May, 1897, and the whole of the Capital was over-subscribed on the day of issue.

It was decided to commence operations on a tentative and moderate scale in order to test what the possible demand might be for electric current, and accordingly a Contract was entered into with Messrs. Crompton & Company, Limited, to erect and equip a single Generating Station with plant of 1,000 Kilowatts capacity, capable of dealing with a initial demand for supplying current to about 60,000 carbon filament lamps of 8 candle power, and to provide and lay all the mains required in the compulsory area as set out in the License, for the sum of £65,000, This was to include the actual expenses

incurred in obtaining the License, estimated at £3,000, which was the only payment made by the Company for the License. There was no promotion money.

Following the most up-to-date practice in England at that time, it was decided to adopt the "Three-wire system" of distribution, generating and delivering Direct Current to Consumers at 450 and 225 volts pressure. The Generating Station was erected on a centrally-situated plot of land in Emambagh Lane, and was equipped with "Crompton" Dynamos, "Willans" Engines, and "Babcock and Wilcox" Boilers. The supply of current from this station was commenced on the 17th April, 1899.

Conductors for distributing the current from the Generating Station to consumers were partly underground and partly overhead. Underground cables were laid in main streets and more thickly-populated districts, and overhead wires erected in the outskirts—the general idea being to replace the overhead lines by the more costly underground cables as the demand grew and the load became assured, moving the overhead wires further out.

When the business was started it was thought that possibly electric energy might be used for ventilating and power purposes, as well as for lighting, but no one imagined that the days of the hand-pulled Punkah were numbered, and that the electrically-driven Fan was destined to overcome the terrors of the hot weather in Calcutta. Such, however, was the case, and the popularity of the Electric Fan, as soon as it was introduced to public notice, ensured the immediate prosperity of the Company, for it provided, at least during a great part of the year, the "day load" which is so essential to the economical working of an Electricity Supply Station. As evidence of this, the Company was able to pay a dividend of $3\frac{1}{2}$ per cent. for 1900, the first year after commencement of supply.

The demand for current for Fans as well as for Lights at once showed that the supply of electrical energy met a real public want, and it was soon found that the single Station at Emambagh Lane, generating Direct Current, as originally planned, was quite inadequate to deal with the constantly increasing requirements of the community. This station had therefore to be enlarged from time to time, and the distributing mains extended. Additional Generating Stations, in different parts of the area covered by the License,

equipped on similar lines to the first Station, were erected and opened, as under :—

Alipore, in March, 1902, with a capacity of	...	750 KW.
Ultadanga, in September, 1906, capacity of	...	1,200 KW.
Howrah, in May, 1906, with a Gas Suction Plant		
to supply	... ..	165 KW.

As the demand for electric current continued to grow, it became necessary to obtain further Licenses from the Government of Bengal to permit of the supply to additional areas. The original License already referred to, dated 1896, covered an area of only 5.64 square miles, while the area for which Licenses are now held is well over 123 square miles.

At the end of 1925 there were 520 miles of underground, and 302 miles of overhead mains—a total of 822 miles.

The applications for current, especially for power purposes for Jute Presses and Mills, continued to increase so rapidly that the Directors decided, in 1909, to instal a High Tension Alternating Current plant at Ultadanga in order to meet the pressing demands for current in the Northern districts of Calcutta. After 13 years of steady development, the Directors came to the conclusion, early in 1910, that still further extensions were essential, and decided that the system of having several stations generating Direct Current at low pressure with only one Station supplying High Tension Current on a comparatively small scale was neither economical nor conducive to the sale of current at a low price. It therefore became evident that it was necessary to erect and to equip a large Central Station suitable for the requirements of Calcutta, generating Alternating Current at High Tension, and supplying Sub-stations in different parts of the City.

This work was put in hand at the end of 1910. A site was acquired for the new Central Station at Cossipore, comprising about 10 acres in the Cossipore-Chitpore Municipality, with a frontage on the River Hooghly. A Siding, connecting with the Eastern Bengal Railway, was constructed so as to ensure the economical delivery of coal and heavy goods. Quarters for the Engineering Staff were erected on the site, facing directly on to the river.

The equipment and lay-out of the Central Station was in accordance with the most up-to-date practice. Everything was so arranged that future additions could be carried out without interfering with the existing Power House or Boilers. Supply of current from the new Central Station commenced on the 20th July, 1912, and the old Generating Stations were gradually closed down but could not be finally abolished until September, 1915. New Sub-stations, where the 6,000 volt Alternating Current is transformed to Direct Current at 450 volts, were built and equipped at: Jackson's Lane, in the business quarter; Wellesley Street, in the European quarter; and Prinsep Street, opposite the original Emambagh Lane Station—while the old generating stations at Ultadanga, Olipore and Howrah were converted into Sub-stations. This, with the accompanying Sub-stations, cost approximately £370,000. In addition to this expenditure the change of system meant the sale or scrapping of machinery, which had become obsolete, at a loss to the Company of some £140,000.

To serve the Sub-station at Howrah it was necessary to lay two special Cables across the River Hooghly, each capable of dealing with 2,500 K. V. A. These Cables weigh 12 tons each, and the laying of them was a work of no small magnitude. They were laid under the Pontoon Bridge which affords them protection from injury due to ships dragging their anchors when going up or down with the tide. The heavy outlay on these Cables was amply justified by the increasing demand for electricity on the Western side of the River. Additional Cables with a carrying capacity of 4,000 K. V. A. have also been laid across the River Hooghly from Cossipore to Belur to form a connecting link with the mains from Howrah and also to serve the districts of Bally and Uttarpara.

The Cossipore Station soon proved inadequate to meet the ever-increasing demand for power, and from 1912 onward frequent additions and extensions were made until, at the present time, the installed generating plant capacity of the Station amounts to 57,500 KW with a Boiler plant evaporative capacity of 730,000 pounds per hour. The system of generation is Alternating Current 6,000 volts, three phase, 50 cycles. This is stepped up for the supply to the Southern area to 30,000 volts.

The High Tension Alternating Current Supply is converted at the Sub-stations to 450 volts—225 volts Direct Current three wire system, and to 400 volts three phase Alternating Current for the supply to the outskirts of the Area.

It may not be out of place to supplement this short historical survey by a few facts showing the progress made since the Corporation's Power Station at Cossipore was started up in 1912.

There were then, after 15 years' working, 6,672 Consumers' Revenue Bills with a connected load of 23,475 KW.

At the 31st December, 1925, the number of Consumers' Revenue Bills totalled 28,056, with a connected load of 85,298 KW.

During the financial year 1925, 9,000 KW. were connected to the mains.

The quantity of coal consumed in 1912 was 17,519 tons, and to the end of 1925 the corresponding figure was about 118,000 tons.

The maximum simultaneous demand on the undertaking up to the end of 1925 was 33,700 KW.

The quantity of electrical energy sold in 1912 was 12,043,398 units, and in the year 1925 the quantity sold amounted to over one hundred million units.

Some idea of the amount of work of a general nature in connection with a Power Supply system of this magnitude may be gathered when it is stated that the total staff and establishment of the Corporation numbers 3,809, of which 1,007 are employed at the Cossipore Power Station, and 1,772 on work connected with the extensive system of mains.

The business of the Corporation has developed so rapidly in the Southern area that the Board have decided to build a new Generating Station there. Good progress has been made up to the present; the first portion of the building for the Station, capable of accommodating 12,000 KW of Plant, has been completed and the Plant is now being erected.

A further extension has been sanctioned to accommodate an additional 36,000 KW of Plant. This extension is also well in hand and a first instalment of the plant has been ordered.

The New Southern Station is designed for an ultimate capacity of 150,000 KW.

LIGHTFOOT REFRIGERATION CO., LTD.

The Ice Factory belonging to this Company was constructed originally for an output of 25 tons per day in 1899, but very soon after it was found necessary to double this capacity. In 1913 a third plant was installed, bringing the total capacity up to 80 tons per day.

There are three tank rooms in which the ice is manufactured in blocks each weighing about 250 lbs. The output of each tank is about 27 tons per day. The ice tanks are on the air agitation can system; and all the ice is manufactured from Lightfoot Machines.

There are three cold-storage chambers with a total capacity of 31,000 c.ft., the temperatures of which can be regulated according to the class of goods stored. There is always one chamber below freezing point, a temperature of 26 degrees being usually maintained. There are also two ice stores with a total capacity of 600 tons of ice.

Another phase of this Company's activity is the manufacture of Oxygen.

THE BRITANNIA BISCUIT CO., LTD.

As long ago as the year 1897 two Bengali gentlemen, interested in the development of local industries, set up a small factory for the manufacture of Biscuits on the site of the present extensive Works.

At the beginning of the Great War, the whole resources of the Factory were placed at the disposal of Government, and during the years of the War very little else was manufactured except standard Army Ration biscuits for the Government. During this period, in order to increase their output, the Proprietors considered it necessary to convert their business into a Limited Liability Company. With the fresh capital thus acquired, modern machinery was installed, and by the time the Armistice was declared, the Company possessed an up-to-date factory capable of producing the very highest standard of machine-made biscuits.

In 1924 the Company again increased its capital from 6 to 20 lakhs, acquiring considerably more machinery for Calcutta, and building an entirely new and up-to-date factory in Bombay.

The Company's present output is at least five times more than it was during the War period, and the two factories they control now constitute the largest biscuit-making concern in Asia.

The Biscuits are manufactured from the finest materials, and no pains are spared in keeping the standard of production to the highest possible level.

This Company is entirely an Indian concern, and claims to be the only firm of Biscuit Manufacturers in Asia whose standard is equal to that of the best imported makes.

MESSRS. JESSOP & CO., LTD.

This firm of Engineers are one of the biggest and most up-to-date in Calcutta. Their Structural workshops are situated in Howrah and Jamshedpur. They have also a Mechanical workshop in Howrah and Railway Rolling Stock works at Garden Reach. Jessop's have been well known for a long time for their Bridge-constructions and Jute mill machinery. Some of the Bridges recently constructed by them are :—

E.B. Ry. Main Line Bridge over Tolly's Nulla; Boat Canal Bridge, for the Calcutta Port Commissioners; Delhi, Jumna Bridge; Barakar, Road Bridge; Champattia, Road Bridge; Gamai, Suspension Bridge, etc., etc.

They have also designed and erected the steel work for the Imperial Bank Building, Calcutta and the Calcutta Royal Exchange Building.

Jessop's have also built and constructed numerous Jetties, Warehouses, Factories, Steel Tanks, Cranes, Pumping Installations, Winding Engines, Textile plants, Wagons, Fitter plants, etc., etc. A visit to Jessop's workshops is well worth the trouble.

THE BENGAL CHEMICAL AND PHARMACEUTICAL WORKS LTD.

It was in 1892 that Sir P. C. Ray conceived the idea of manufacturing drugs and chemicals on a small scale from indigenous materials, and started the Bengal Chemical & Pharmaceutical Works in an unpretentious way at 91, Upper Circular Road, Calcutta. He was joined later on by two friends, Dr. Amulya Charan Bose, M.B., and Mr. Satis Chandra Sinha, M.A. They were all young men, just starting in life, having very little capital and still less business experience—but they had imagination and plenty of enthusiasm. Sir P. C. Ray took upon himself the devising of



BENGAL CHEMICAL AND PHARMACEUTICAL WORKS.

processes; Dr. A. C. Bose looked after the medical side and clinical trials of new drugs; while the manufacture and general management were entrusted to Mr. S. C. Sinha. A series of preparations, having as their basis reputed Indian drugs, was started, and the manufacture of some preparations of the British Pharmacopœia and a few chemical products was also taken up.

India has a medical system of its own and abounds in raw materials. But the pioneers of the new venture had to struggle against tremendous odds. Who would care to use their products? On the one hand was ranged the Medical profession who were reluctant to use anything that did not originate from the renowned manufacturers of Europe. On the other side were the followers of the indigenous system who considered it sacrilegious to deviate from the formulas laid down in the Ayurveda. Yet the new Company had the presumption to combine the wisdom of the East and the West, to utilise indigenous materials and modern scientific methods, and to present Indian drugs in the form of extracts and tinctures.

But the ground was not entirely unprepared. Eminent medical authorities and pharmacologists like Ainslie, Waring, Wise, Udoy Chand Dutt, Kanai Lal Dey, Dymock, Warden and Hooper had experimented with many Indian drugs and had praised them in unstinted terms. Few medical practitioners had knowledge of such research, but the record was existent. Indeed, Government had gone so far as to publish an Indian and Colonial Addendum to the official Pharmacopœia in which many preparations of indigenous drugs were incorporated. The promoters of the new concern did not fail to take advantage of such official sanction, and slowly but surely their products began to gain favour among both doctors and the general public.

The Bengal Chemical & Pharmaceutical Works was incorporated as a Public Limited Company in 1901 with a registered capital of Rs. 50,000. Among others who helped in organising the Company, the names that deserve prominent mention are those of the late Prof. Chandra Bhusan Bhaduri of the Presidency College, the late Mr. Bhut Nath Paul of Messrs. B. K. Paul & Co. and Dr. Kartick Chandra Bose, M.B. The works at Upper Circular Road were extended and much new machinery was set up. In those days, it was exceedingly difficult to attract capital, and many were the anxious days that the Directors had to pass owing to want of funds

for meeting the needs of the growing business. The Company, however, had the good fortune to earn dividends from the very start, and capital began to flow in gradually.

As years passed, the sales grew in volume and the Works needed continual extension. From the initial Rs. 50,000, the capital was gradually raised to, ultimately, 19 lakhs. The sales have risen from Rs. 25,000 in the first year to Rs. 29,00,000 in the twenty-sixth year.

The Company's share-holders now number about 700. Among them are renowned scientists, high Government officials, eminent members of the medical and legal professions, famous literary men and educationists, big merchants and zemindars. It is gratifying to note that the Company still counts among its share-holders practically all the men who joined it in its earliest days—the connection in many instances extending over a period of a quarter of a century.

On account of the growing volume of business, the Works had to be removed to Maniktala in 1905. The plot originally acquired was 10 bighas. This has gradually been extended up to 40 bighas ($13\frac{1}{2}$ acres), and the entire area is now fully occupied. The Works are situated at the farthest end of the Maniktala Main Road and command a picturesque view of the Salt Lakes.

Further expansion being impossible at Maniktala, the Company purchased between 1919 and 1921 about 135 bighas (45 acres) of land at Panihati on the Barrackpore Trunk Road. 85 bighas of this land were acquired on behalf of the Company by the Government under the Land Acquisition Act, which sanctions such acquirement for undertakings of public utility.

The Maniktala Works have a covered floor area of 1,50,000 square feet. There are 53 buildings used for different purposes. The metalled roads within the Works have a total length of 2 miles, and there are $1\frac{1}{2}$ miles of trolley lines. The chief motive power is electricity generated within the Works. This is supplemented by several stream and oil engines distributed over the factory. There are also a number of boilers for furnishing steam to the various chemical and pharmaceutical plants. The Works consume 80,000 gallons of water daily, the whole of which is pumped from a $2\frac{1}{2}$ inch tube-well sunk by the Company in 1919.

The Company has its own printing press, saw-mill for making packing cases and casks, and several elaborately equipped workshops.

The principal lines of manufacture are Chemicals, Pharmaceutical Preparations and Scientific Instruments. The Company also makes Disinfectants, Surgical Dressings, Laboratory Furniture, Gas Generators, Fire Extinguishers and several other kinds of mechanical appliances.

There are six Sulphuric Acid Chambers at the Maniktala Works having a total capacity of 10 tons of acid daily. A new set of chambers of the latest design is in course of erection at the Panihati Works. The Company has also the newest types of Nitric and Hydrochloric Acid Stills.

Some of the other important chemicals made are Ammonia, Aluminium Sulphate, Alum, Nitrate of Potash, Sulphate of Magnesium, Sulphate of Iron, Nitrate of Silver, Hyposulphite of Soda, Dextrine and Caffeine. The Aluminium Sulphate made by the Company is in great demand for purification of water, and large quantities are taken by various municipalities for their water works.

The Pharmaceutical Department is equipped with numerous appliances such as drug mills, percolators, extractors, concentrating pans, vacuum stills, hydraulic presses, etc. Alcoholic preparations are made in a bonded laboratory under the control of the Government Excise Department. There are also separate sections for making Hypodermic Ampoules, Surgical Dressings, Disinfectants, Toilet Preparations, etc.

Besides the preparations of the British Pharmacopœia, the Company manufactures a great variety of medicinal products from Indian indigenous drugs which are in wide demand and largely prescribed by the Profession. It is satisfactory to note that even practitioners of the orthodox Ayurvedic School are recognising the merits of these products as regards their reliability, convenience in use and keeping quality.

The Workshops are a vital part of the whole organisation. Besides making Scientific Instruments for sale, this department is constantly engaged in turning out special plants for the Company's own use and in maintaining the appliances in proper working order. The equipment of this department is necessarily elaborate, there being a drawing and estimating office, pattern-makers' shop, smiths'

shop, foundry, and numerous machines like steam hammers, turning lathes, spinning lathes, polishing lathes, punching and shearing presses, automatic saws, drills and other appliances.

Among the Apparatus turned out are Gas and Water Cocks for laboratory use, Gas Burners and Blowpipes, Stands and Clamps of various kinds, delicate Chemical Balances and other instruments of precision. The department also constructs Gas Plants, Fire Extinguishers, Oxygen Apparatus, Water Stills, Surgical Sterilizers, etc. During the War, the Company supplied thousands of Fire Extinguishers for use in Mesopotamia and elsewhere.

The Company undertakes the installation of Tube Wells, for which purpose a large staff of skilful operators is maintained. The system of boring is calculated to ensure the largest yield of water and the longest service. Numerous wells have been sunk for District Boards, Municipalities and various other public and private concerns.

The manufacture of Surgical Dressings, and distillation of Coal Tar, are carried on at the Panihati Works. The plant used for making Surgical Cotton is of the latest type, and consists of a number of machines through which the raw cotton has to pass so as to be fully opened out, cleansed, made absorbent, bleached, medicated, combed, rolled, packed and finally sterilised. Rolled Bandages, Gauzes and Dressings of other kinds are also made. The Company specialises in Compressed Dressings which are made by subjecting the finished cotton, bandage, or gauze, to great pressure. These dressings, being of small bulk, are particularly adapted for military use and for other purposes where saving of space is necessary. Large quantities of such dressings were supplied to Government during the War.

The Tar Distillery yields Creosote, Anthracene Oil and Pitch. The first two are converted into Disinfectants and Wood preservatives. The Pitch finds a market for treating roads, waterproofing, and other purposes.

The Company has a well-equipped Laboratory where a large staff of trained chemists are engaged in testing every item manufactured to ensure the maintenance of proper standards. Experiments for devising new processes and improvements are also conducted in this department.

About 1400 men are employed by the Company, of whom 400 are resident in the Works. Comfortable family quarters have been

provided for some of the superior officers. A hospital and dispensary, under the charge of a qualified medical officer, provide free treatment in case of illness. Every servant of the Company earning over Rs. 15 a month is entitled to the benefits of a Provident Fund, to which the Company contributes a portion of its profits. There is a Fire Brigade, with a trained staff, whose efficiency is maintained by frequent drill. The officers have a Club and a Circulating Library, and there are facilities for outdoor games.

The Directors of the Bengal Chemical & Pharmaceutical Works, Ltd., fully realise that there are yet many difficulties to solve, many shortcomings to remedy, many improvements to make. Whatever has been achieved would not have been possible but for the co-operation of the friends and customers of the Company and their keen interest in its well-being. On behalf of those responsible for the management, it may be said without exaggeration that there is no lack of desire to improve, and to be more and more worthy of the good-will, which is the most cherished asset of the Company.

THE BENGAL IMMUNITY CO., LTD.

This was started in 1919, under a Board of Directors and a Working Committee, consisting of prominent members of the Medical profession, for the preparation of Sera, Vaccines and other injectable products. The great War had hardly ended, and the supply of Drugs, specially of Sera and Vaccines, from Europe and America was inadequate, irregular and uncertain. The prices charged were sometimes exorbitant, and the difficulties and delays in transit caused marked deterioration in the quality of the Biological products, which are apt to lose much of their potency with lapse of time. These were the considerations which led certain members of the Medical profession to deviate from their ordinary line and spend much of their valuable time in the organisation and development of the Laboratory of the Company.

In the preparation of indigenous biological products, this pioneer concern has successfully maintained and, by merit, gradually strengthened its reputation in the estimation of the general and the Medical public. The Company now possesses at 153, Dharamtolah Street, Calcutta, a most up-to-date Laboratory and a big stable. All

work is carried on under the direct supervision of Medical experts, and hence the products are always fresh and genuine. They enjoy the confidence and support of many Medical College Hospitals, State Dispensaries and Hospitals, District and Local Fund Hospitals, and Charitable Dispensaries, throughout India, Burma, Singapore, the Malay Peninsula, Mesopotamia, East Africa, etc.

Manufacture of Fresh Sera is a speciality of the Company. After a period of continuous research, the Company has successfully prepared on a manufacturing scale, Normal Horse Serum, Anti-Streptococcal Serum, Diphtheria Antitoxic Serum, and Anti-Dysenteric Serum. They have been tested in several well established Laboratories in India and they have received recognition from the highest authorities. The confidence and support that the Company has steadily gained from the Medical profession, are conclusive proofs of the genuineness of the products. Freshness, as is now well known, increases the potency of all biological products, specially that of Sera. The Sera and Vaccines produced by the Company, being prepared from local virulent strains of microbes and being always fresh, have been found highly efficacious. Bacteria vary in character in different countries. The Vaccines, prepared in India from local virulent strains, undoubtedly produce better results than stock vaccines imported from foreign lands. Many eminent physicians have certified to the superiority of the Company's products over those indented from outside India.

The Committee of the Far Eastern Association of Tropical Medicine included a visit to the Laboratory of the Company in the programme of excursions to a few places of scientific interest in Calcutta, and recommended this to the delegates in the following words—"Formerly the Profession in India had to depend on outside sources for its supplies of Vaccines and Anti-Sera. Lately however, successful beginnings have been made, and visitors may see what progress has been achieved in this direction by visits to the Bengal Immunity Laboratory."

The success of the Company has proved, by experiment and experience, that success can be achieved in the preparation of Sera, Vaccines, and other organotherapeutic products, in the Plains and under physical conditions similar to those in which the disease, for which they are utilised, flourish. It has done useful work, by pro-

viding fresh and reliable products to the country at large, and one has not to depend any longer upon a foreign supply. The Company intends to provide further facilities for research for scientific workers along those lines.

CLINICAL RESEARCH ASSOCIATION, CALCUTTA.

This—a non-official institution for the laboratory diagnosis of disease—was perhaps the first attempt by non-official medical men in this part of India to conduct laboratory work outside Government institutions. It was started in the year 1908, in a small room belonging to the Calcutta Medical Club, with a microscope and a couple of small tables, by a band of 4 young Medical graduates of Calcutta University. The laboratory was started at a period when the Profession did not appreciate very much the need for scientific investigation and diagnosis of diseases.

Subsequently, the Laboratory sent some of its workers to Europe to improve their knowledge of technical matters connected with Microbiology, Parasitology and Bio-chemistry. The volume of work controlled by the Laboratory can be judged by the fact that it now maintains a staff of 8 highly qualified medical men, 2 chemists and 30 other assistants for managing the departments of (1) Clinical blood work, bacteriology and parasitology; (2) Bio-chemistry; (3) Analytical Chemistry; and (4) Vaccine manufacture. The organisers felt that a high degree of efficiency could not be maintained without simultaneous research work, and they have, therefore, made an annual grant for research. Up to 1927, its workers have contributed 41 original papers to various journals on Bacteriology, Parasitology and Bio-chemistry. At present, an important enquiry under the Indian Research Fund Association is being conducted by one of the workers of this Association.

INDIAN BROADCASTING COMPANY.

Prior to the formation of the *Indian Broadcasting Co.*, a Broadcasting service was carried out in Calcutta by various well known amateurs whose activities commenced some five years ago; and from that time onwards they did much to popularise broadcasting and undoubtedly did a lot of very valuable research work.

7 CA, the Calcutta Station of the Indian Broadcasting Co., was opened by H.E. the Governor of Bengal on the 26th of August, 1927, and since that date a regular service has been carried on. The offices of the Company are situated at 1, Garstin Place, where a visitor will find a large Studio used for broadcasting music, and a smaller Studio on the top floor which is used principally for talks. Another room is set apart to accommodate all the necessary amplifiers and switch gear which amplify the electrical vibrations set up in the microphone. Having done this, they pass the programme on to the Transmitter, *via* a land-line. The Transmitter, which is a replica of that used at the London Station of the British Broadcasting Corporation (B. B. C.), is situated at Cossipore, and has a power input to the main magnifier of 3 KW. The wave length is 730.4 metres, and Programmes have been heard from this Station as far afield as New Zealand and Australia, so that it is not surprising to know that there are very few places in India which cannot receive the Calcutta programme.

CHAPTER IX.

PLACES WORTHY OF A VISIT IN AND NEAR CALCUTTA.

SIGHTS OF CALCUTTA.

Government House was built in 1803, and is a fine building standing at the northern end of the Maidan. Its Darbar Chamber, Ball Room, and grounds are specially noteworthy.

The High Court stands near the northern end of the Eden Gardens. It is a Gothic structure completed in 1872. It has a 180-foot tower from which a good view of the Maidan is obtained.

The Town Hall, which at present houses the Bengal Legislative Council, is an imposing building with a hall 172 feet by 65 feet on the first floor, entered by a flight of steps leading from the street.

The Charnock Mausoleum is the oldest piece of Masonry in Calcutta and shelters the tomb of Charnock.

Dalhousie Square has already been described.

The General Post Office is a noble structure on the west side of the above Square. Its large white dome rests on tall Corinthian columns and forms the roof of a doorless round hall where stamps are sold to the public. It was finished in 1868, and occupies part of the site of the old Fort of Calcutta, as shown by brass lines on the steps.

The Holwell Monument was erected to commemorate the burial place of those who perished in the 'Black Hole' of Calcutta. It is at the North-Western end of Dalhousie Square, and is built of marble.

Writers' Buildings occupy the whole length of the Northern side of Dalhousie Square. It houses the Bengal Secretariat Offices.

The Commercial Museum is somewhat unimposing from outside; but a visit to its rooms (open from 10-30 a.m. to 5-30 p.m. on week days; Saturdays up to 2-30 p.m. only) will largely repay the trouble. It is a permanent exhibition of goods of Indian manufacture in various stages of finish.

The Howrah Bridge was constructed in 1874 by Sir Bradford Leslie at a cost of 22 lakhs of rupees. It is a most remarkable bridge in that it was not meant to bear the traffic that it eventually

had to bear. Though built as a temporary affair, it has been since the date of its construction the only bridge between Calcutta and Howrah and, as such, it carries every day a very heavy traffic of buses, carts, cars and pedestrians. It is a pontoon bridge, and can be taken to pieces at the centre for the purpose of allowing large vessels to pass through. Proposals are now being considered for replacing it by a more permanent structure.

The Mint on the Strand Road is the only other mint in India besides the Bombay mint. It can stamp off nearly 20,000,000 rupees every day, if necessary.

The Ochterlony Monument is a tall column that stands alone on the Maidan near Chowringhee. It is 165 feet high, and one can climb to the top by an inside staircase. The keys are with the Commissioner of Police, and can be obtained on application. It was erected in honour of Sir David Ochterlony who fought against Nepal a hundred years ago.

The New Market—commonly known as Sir Stuart Hogg Market—with its big clock tower, stands on Lindsay Street. It was built in 1874, but has since been considerably extended. It has about 5,000 well-arranged stalls which are a delight to the visitor.

The Indian Museum and the *Asiatic Society of Bengal* have been previously described. So also has the *Victoria Memorial*.

Fort William, built in 1773, is an octagonal-shaped structure surrounded on all sides by a fosse. The Fort area includes Barracks for soldiers, an Arsenal, Magazines, Parade grounds, etc.

The Zoological Gardens, Alipore, contain a rich collection of animals, birds, reptiles, etc. It well merits a visit.

Belvedere, Alipore, was the official residence of the Lieutenant-Governors of Bengal from 1854 until 1912, when it became a Viceregal residence.

The Agri-Horticultural Gardens of Alipore, which contain a bust of William Carey, the founder of the Gardens, is also a place worthy of a visit.

Kalighat Temple, which stands on the Adi-ganga, is considered a sacred place by the Hindus and is visited by thousands of pilgrims every month. The present temple was erected in 1809.

The Jain Temples are situated in Halsibagan (off Upper Circular Road), in North Calcutta. The picturesque structure of the

temples, their superb archway, decorated walls and steps, the impressive sanctuary, and the Sish Mahal (Place of Mirrors), attract streams of visitors every evening.

The Parsee Towers of Silence are situated on the Beliaghatta Main Road (East Sealdah). The main white tower stands in a large quadrangle, whose interior consists of rows of hollowed-out spaces where corpses are laid.

The Marble Palace of the Mullicks of Mukhtaram Babu's Street (off Chittaranjan Avenue) contains numerous statues, and a large collection of paintings by great Masters.

The Royal Botanical Gardens at Sibpur, on the Howrah side of the Ganges, were founded in 1786 by the East India Company. They comprise an area of about 270 acres, with a river frontage of over a mile. The gigantic Banyan Tree in the centre of the Gardens is considered by many as the largest tree in the world.

MONUMENTS ON THE MAIDAN.

The Calcutta Maidan contains a large number of Monuments and Statues erected in memory of historical personages. Of the statues the following may be mentioned: Lord Hardinge, Lord Roberts, the Marquess of Dufferin and Ava, and Sir James Outram (near Park Street).

At the extreme Southern end of the Maidan near the Ganges is situated the *Lascar Memorial*. This handsome stone tower was erected in memory of the Lascars of Bengal and Assam who lost their lives in the Great War.

The Cenotaph at the Northern end of the Maidan was erected in memory of the European residents of Calcutta who fell in the Great War.

PLACES OF WORSHIP IN CALCUTTA.

Calcutta possesses a large number of Churches, of which the Cathedral is the finest. There are also places of worship sacred to the Hindus, the Muhammadans, the Buddhists, the Jews, the Parsees and the Jains. *The New Synagogue* (Canning Street) is one of the handsomest Jewish places of worship in Calcutta. *The Parsee Fire*

Temple, situated at 26, Ezra Street, attracts all Parsee visitors to Calcutta. The *Kalighat Temple*, The *Thanthania Kali Temple*, The *Jain Temple* off Circular Road, and The *Buddhist Vihara* (on College Square); deserve special mention in this connection.

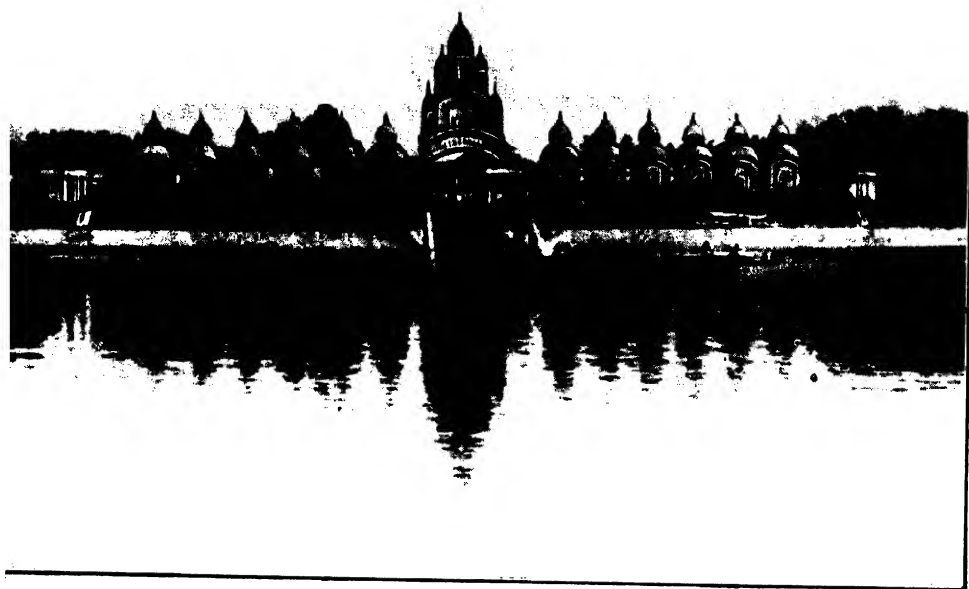
THE BELUR MATH.

About six miles to the north of Calcutta on the right bank of the Ganges stands the famous monastery of Belur, founded in 1899 by the late Swami Vivekananda after his signal success at the Parliament of Religions held at Chicago, U.S.A., where he represented Hinduism. He was the apostle of the Neo-Vedantic movement which has awakened in the hearts of the people of India a consciousness of their ancient religious culture and a sense of duty and responsibility to their spiritual heritage. This movement has since spread over India as well as abroad, and there are now over 100 branches. The institution trains young men in the ideals of renunciation and service, and seeks to popularise through their medium the teachings of the Vedantic scripture and its universal truths. The spiritual ideas of the ancient wisdom of the East are disseminated in the West by teachers trained in the Math, thus working towards helpful union of the ideals of the East and the West.

It is also the head-quarters of the Ramkrishna Mission, one of the premier Social Service organisations actuated by the ideals of renunciation and service. A charitable Dispensary, an Industrial School, and a Guest House, is attached to the Math.

In the City of Calcutta, besides educational institutions and orphanages, there are two centres mainly for the publication of the Ramkrishna-Vivekananda literature, including three monthly magazines the 'Udbodhan' in Bengali, published from 1, Mukherjee Lane, the 'Samanway' in Hindi, and the 'Prabuddha Bharata' in English from 182A, Muktaram Babu Street, Calcutta.

The Port Commissioners of Calcutta have established a Ferry Steamer Station close to the Belur Math and it is a delightful trip from Calcutta to where the monastery is situated. It is also a 10 minutes' walk from the Grand Trunk Road, along which the Howrah-Bally Khal Motor Buses ply.



DAKSHINESHWAR TEMPLES.



ALIPORE OBSERVATORY.

THE TEMPLE OF DAKSHINESHWAR.

A few miles above Calcutta on the left bank of the Ganges stands the beautiful temple-garden of Dakshineshwar, known as Rani Rashmani's Kali-bari, or the Temple of the Divine Mother. A fine row of 12 Shiva Temples, facing the river front, make a picturesque foreground. Sri Ramkrishna Paramhansa, the saint of Dakshineshwar, practised great austerities here and ultimately realised God. He conceived the original idea of learning the different methods of worship from the professed teachers of the principal religions of the world, Hinduism, Mahomedanism and Christianity, one after another, and from direct experience arrived at the great truth of the harmony underlying all religions. Thus, by direct experience, he came to the conclusion that all religions constitute so many paths leading to the same goal. His profound wisdom and sanctity of life drew towards him many famous men of his time, among whom was Babu Keshub Chandra Sen, the celebrated leader of the Brahmo movement. His life was an embodiment of sweet-souled sympathy and love to persons of all religious faiths, as he tirelessly preached to those who came to him. He trained and left behind him several *sannyasin* disciples, chief among them was Swami Vivekananda, the founder of the Ramkrishna Mission and the Neo-Vedantic movement referred to in the last paragraph. Many people of all religious beliefs visit his *sadhana* (place of meditation), and the room in which he lived, and consider Dakshineshwar as a place of pilgrimage. The garden is about 6 miles north of Calcutta, and can be easily reached by a Bus service from Shambazar *viâ* Cossipore Road, as well as a Ferry Steamer service of the Port Commissioners. Country boats are also available from Calcutta.

THE PRAKRITI

EDITED BY

SATYA CHURN LAW, M.A., B.L., Ph.D., F.Z.S., M.B.O.U.

A thoroughly authentic and profusely illustrated Magazine : The only Journal of its kind in Bengali ; appearing every two months : Deals with a wide range of Science subjects connected with Agriculture, Mathematics, Anthropology, Chemistry, Physics, Geology, Physiology, Experimental Psychology, Zoology, Botany and various other branches of Science,
- - - theoretical and applied - - -

Recommended by the Education Department
- - ment to Schools and Colleges - -

Orders to—

THE MANAGER,

PRAKRITI OFFICE,

24, SUKEAS STREET, CALCUTTA,

Leitz

Microscopes

for all scientific investigations in medical,
chemical, metallographical laboratories.



DARKFIELD CONDENSERS

of highest numerical aperture for ultra-
microscopic observations.

Leitz-Colorimeters

strata 20, 50 or 100 mm. in depth.

For chemical, technical and clinical investigations.

Highest accuracy and solidity.

Half-Shadow Polarimeters

Drs. Steeg and Reuter.

Centrifuges

arranged to be driven by hand, water or electricity.

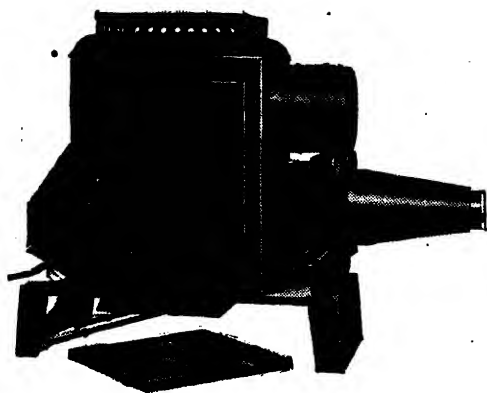
GRUEBLER STAINS for all purposes.

Laboratory GLASS-GOODS of best make.

For particulars ask:

H. E. METZKES & CO.

7, ESPLANADE EAST
CALCUTTA



Bausch & Lomb's
BALOPTICON
MODEL JCRM

*An attention-getting, interest-holding
projection device, admirably suited for use
as an educational factor.*

Visual Instruction is Best

As an aid to instruction—and particularly the instruction of medical subjects—the Balopticon is of real value. The lecturer's words may or may not create the intended impression—but a clearly defined, natural colored, conveniently enlarged and projected image of an object on a screen is always explicit.

The Balopticon's unusually efficient illuminant, together with typical Bausch & Lomb high quality achromatic lenses and a highly efficient reflecting system, are the reasons why image projected by this instrument are clearly defined to the very edge, with an equal distribution of light over the entire screen.

A four and one-half foot square screen is regularly supplied ; a six foot screen at slight additional cost.

The combined Balopticon's ability to project opaque objects such as photographs, book pages or solid objects as well as slides, makes it adaptable for all kinds of class or lecture room work with but little preparation of material.

We will be pleased to send you descriptive literature.

AGENTS IN INDIA—

L. H. ALLISTON & CO., LTD.

CALCUTTA :

**B-5, Clive Buildings
P. O. Box 2136.**

BOMBAY :

**Ahmedabad House, Wittet Road
P. O. Box 435.**

BAUSCH & LOMB OPTICAL COMPANY, Rochester, N. Y., U. S. A.

STOCKIST FOR BENGAL :

**THE BENGAL CHEMICAL & PHARMACEUTICAL WORKS, Ltd.
15, College Square, Calcutta.**

SCIENTIFIC APPARATUS

Microscopes (E. Leitz's & Zeiss's)
Dr. Witt's Peptone, Dr. Grubler's
Stains, Incubators (Hearson's), Haemo-
Globinometer (Shati's), Haemocyto-
meters (Thoma, Burkur), Autoclaves,
Sterilisers, Sartorius, Bunge and other
Analytical Balances, Jena, Pyrex,
Cavalier, Bohemian Glasswares,
S. C. P. Porcelain, Berlin and Royal
Berlin Porcelain Goods, F. Merck's
Reagents, Pure Chemicals etc., Plati-
num, Silica, and Nickel Rubber Goods
and other Scientific Rare Apparatus.

Please apply for further particulars to:—

THE LILY & CO.

HEAD OFFICE:

26, COLLEGE STREET MARKET

GODOWN:

84-1, BOLORAM DEY'S STREET,

Tele: "DISCOVERY" Calcutta

Phone: 3056 Barabazar

CALCUTTA

Visitors to the 14th Session of the Indian Science Congress are respectfully requested to pay a visit to our stall at the exhibition ground and also to our laboratory.

BENGAL IMMUNITY CO., Ltd

ESTABLISHED 1919

The Premier Establishment for the manufacture of
SERA, VACCINES, INJECTULES

AND OTHER

ORGANOTHERAPEUTIC PRODUCTS.

Managed by an Unique Board consisting of eminent Members of the Medical Profession.

Laboratory fitted up with most up-to-date apparatus.

Works carried on under the direct supervision of medical experts and hence products absolutely genuine and reliable.

*Awarded gold medals at All-India Exhibitions held at
POONA, AGRA, RANGOON, CALCUTTA, etc.*

Doctor's Reputation Depends on the Brand he uses.

IT IS THE
FRESHNESS

That Counts in all Biological Products.

Manufacture of

SERA

A SPECIALITY

Always fresh and highly efficacious.

Largely used in Hospitals with highly satisfactory results.

VACCINES

SPECIAL VACCINES

All freshly prepared from highly virulent local strains.

Terms, Lists and Literature on request.

**153, Dharamtollah Street,
CALCUTTA.**

TELEGRAMS: "INJECTULE."

**WE BEG TO INTRODUCE OURSELVES
AS THE
LARGEST AND MOST VARIED STOCKHOLDERS**

— OF —

Research Chemicals, Chemical Apparatus, Chemical Glassware, "R" Glass, "Pyrex" (American) Glass, Physical Apparatus, Stains and Reagents, Bacteriological and Biological Products and Appliances, Hearson's Incubators and Sterilisers, etc., Strohlein Apparatus, Petrol Gas Plants, Grubler Stains, Platinumware, Rubber Goods, Porcelainware, Nickel Goods, Fisher and various other Burners, Kahn Test Apparatus, Photo Goods, Entomological Pins and other Requisites, Colorimeters, Microscopes, and in fact anything in the Scientific line.

Special Price Lists are in Preparation and are available
as published, for each section.

Laboratory Fitting and Furnishing—A Speciality

Your orders and enquiries solicited.

SCIENTIFIC SUPPLIES (BENGAL) CO.

29 & 30, College Street Market

"SCIENCE" BLOCK

CALCUTTA.

Telegrams : BITISYND, Calcutta.

Telephone : Burrabazar, 524.

**Pure Chemicals, Chemical and Bacteriological
Apparatus, Reagents, Stains, and all
sorts of Laboratory requisites.**



Please enquire at

**THE RESEARCH LABORATORY
BUTTO KRISTO PAUL & CO.**

**22, BONFIELD LANE
CALCUTTA**

Telegrams : "MASTERS" Calcutta.

Phone : BURRABAZAR 1934.

CHUCKERVERTY, CHATTERJEE & Co., LTD.

(Founded under the inspiration and Guidance of Acharyya Sir P. C. Ray.)

15, COLLEGE SQUARE, CALCUTTA.

Booksellers, Publishers and Importers of Scientific and Literary Magazines and Periodicals.

Hold an exceptionally large and varied stock of books, in every department of Art, Science and Letters.

Our Catalogues of educational, technical, engineering, vernacular and other books published monthly and sent free on request.

General and Scientific books, periodicals supplied to order from any part of the world. Heavy consignments of new books received by every mail from Europe and America.

Agents for the sale of Calcutta University Publications. Catalogues on request.

Suppliers of books to Government Departments, Universities, Public Libraries, and Schools and Colleges throughout India.

Publishers of Cunningham's Ancient Geography of India, McCrindle's Ptolemy with scholarly introduction and notes, McCrindle's Megasthenes, R. G. Bhandarkar's Early History of the Deccan, etc.

We are not a Back Number.

A Trial will convince you.

SHIP BRAND

ACIDS, CHEMICALS, FERTILISERS & INSECTICIDES & FUNGICIDES.

(Single & Complete)

A SPECIALITY.

Complete Mixtures for all Crops and Particular soils BONESUPER AND BASIC BONESUPER.

Battery Acid, Nitric Acid for Gold Refining and Pure Acids for Research work.

We are suppliers to Govt. Rlys., Dispensaries, Universities, Colleges, Research Institutes, Testing Labys., Govt. Medl. Stores, etc., etc., etc.

STANDARD QUALITY & EFFICIENT SERVICE MOTTO.

Details on application to :

Messrs. D. M. C. Co., Ltd.,
(Factory)
Ambernath (near Kalyan, G. I. P.)

Messrs. D. M. C. Co., Ltd.,
(Hd. Office) Sudma House,
31, Spott Road,
Ballard Estate, Fort, Bombay.

Telegrams : CHEMICAL, ABH.
Telephone : No. Trunk Line ABH.

Telegrams : "DHARMAJAYA" BOMBAY.
Telephone : --22750.

Managing Agents.

DHARAMSI MORARJI & CO., Bombay.

MANSFIELD & SONS

16, TANGRA ROAD, CALCUTTA.

Solicit your enquiries for:—

Doors and Windows - - -

Staircases and Flooring - -

Mill Skylights - - - -

Office Partitions - - - -

Machine Sawn Teak - - -



Chemical Benches and other
Furniture for Science Labora-
tories and Technical and
Industrial Schools - - -



Desks and other Furniture for
Colleges and High Schools -

Equipment of all kinds for
Educational Institutions - -

Oil Gas Plants - - - -

Gas and Water Fittings - -

SPENCER

MICROSCOPES, MICROTOMES, PROJECTORS, REFRACTOMETERS AND SPECTROMETERS.

KLETT

COLORIMETERS AND NEPHELOMETERS.

KAHLBAUM

CHEMICALS, REAGENTS, INDICATORS AND STAINS.

LEEDS AND NORTHRUP

GALVANOMETERS, RESISTANCES, POTENTIOMETERS, PYROMETERS AND OTHER ELECTRICAL MEASURING INSTRUMENTS.

CENCO

HYVAC AND SUPERVAC PUMPS, CENCO-WESTON GALVANOMETERS, ELECTROMETRIC TITRATION APPARATUS, MOTOR STIRRERS AND OTHER APPARATUS.

GAERTNER

SPECTROMETERS, SPECTROGRAPHS, INTERFEROMETERS, COLORIMETERS, STANDS AND OTHER PHYSICAL APPARATUS.

PYREX

CHEMICAL GLASSWARE.

VOLAND

ANALYTICAL BALANCES AND WEIGHTS.

"SICO" SPECIALITIES

Own Manufactures :

All kinds of table-blown glassware for routine and research work, viz., Test Tubes, Specimen Tubes, Kohlrausch's Cell, Mercury Lamp, etc., Laboratory Fittings *e. g.*, Gas and Water, Lamps, Stands of all kinds; Physical Apparatus : Meter Bridges, Potentiometers, Resistances, etc., etc.

The Scientific Instrument Co., Ltd.

1 JOHNSTONGUNJ
ALLAHABAD

36 CENTRAL AVENUE
CALCUTTA,



Do you want any RARE SUGARS?

Use "DIFCO"

Rare Sugars in your Research work.

Do you want any CULTURE MEDIA?

Use "BACTO" DEHYDRATED

Culture Media. You will have uniform results.

Further, they are simple to use, and cheap in the long run.

DO YOU WANT PEPTONE, AGAR and other
Bacteriological REAGENTS?

Use BACTO-PEPTONE, BACTO-AGAR

and various other

"B A C T O"

Products regularly used everywhere.

DO YOU FOLLOW "STANDARD METHODS?"

Then you should always use

"DIFCO" or "BACTO" PRODUCTS

in your work, as these are recommended.

Ask us for Price Lists and Pamphlets of "DIFCO" Goods.

MADE BY

DIGESTIVE FERMENTS CO.

DETROIT, U.S.A.

Sole Indian Agents:

SCIENTIFIC SUPPLIES (BENGAL) CO.

29 & 30, College Street Market

"SCIENCE" BLOCK

CALCUTTA,

Telegrams : BITISYND, Calcutta.

Telephone : Burrabazar, 524.



BENGAL CHEMICAL WORKS : VIEW FROM THE SALT LAKES

WE STOCK

All sorts of Scientific Apparatus, Jena and Pyrex Glass Goods, Royal Berlin Porcelain, Laboratory Chemicals, Guaranteed Reagents, Microscopes, Balances, Binoculars, etc., etc.

WE UNDERTAKE

to furnish and fit up Laboratory with Gas,
Water and Electric fittings

**Bengal Chemical and
Pharmaceutical Works, Ltd.,**

CALCUTTA

NADIA CHEMICAL WORKS

C44 & 46, COLLEGE STREET MARKET, CALCUTTA

Stockists of :—

1. Pure and Analytical Chemicals, Stains, Media, etc.
2. H-ion Indicators and Buffers.
3. Special reagents for refractive index, molecular weights, calorimetry, etc.
4. Analysed Minerals and Alloys with certificate.
5. General Apparatus of Pyrex and Jena and other laboratory glasses. Royal Berlin and S. C. P. porcelain wares.
6. Volumetric apparatus,—ordinary, standard and certified.
7. Physical Chemistry Apparatus,—Gas electrodes. Beckmann and other apparatus. Rheostats, Resistances, etc.
8. Physical Apparatus for Colleges.
9. Biological Apparatus,—Microscopes, Microtomes, Incubators, Autoclaves, etc.
10. Balances—Analytical, Precision and Assay. Weight Boxes w/ certificates.

Makers of :—

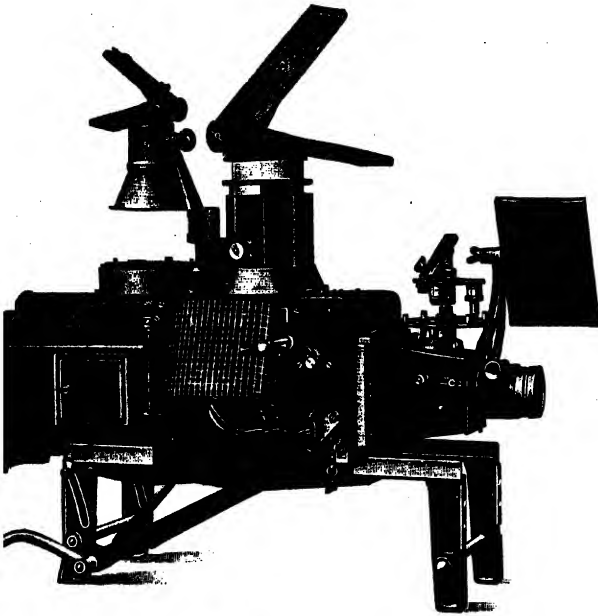
Incubators, sterilisers, and general laboratory goods. Special Apparatus of customers specification.

Laboratory Furnishers :—

Designers and fitters of laboratories.

NADIA CHEMICAL WORKS, CALCUTTA

Zeiss Ikon



EPIDIASCOPES

LANTERNS

CAMERAS

CINE

PROJECTORS

ETC.



ZEISS

MICROSCOPES

SPECTROMETERS

REFRACTOMETERS

TELESCOPES

ETC.

Sole distributors in British India

Adair Dutt & Co Ltd
INCORPORATE IN ENGLAND.
HEAD OFFICE
47, VICTORIA ST. LONDON.
Stephen House
5, Dalhousie Sq.
CALCUTTA.
Exchange Building
Ballard Estate
BOMBAY.

Exhibiting at the Indian Science Congress, Calcutta, 1928

Phone—BB 2217

Tel. Address—"Testube"

BENGAL SCIENTIFIC APPARATUS & MINERALS CO.

146, Cornwallis Street, Calcutta.

Laboratory Furnishers, and Manufacturers : Government Suppliers.

Chemical, Physical, Bacteriological, Botanical, Mycological,
Entomological Appliances and Chemicals and
Reagents Stocked in large quantities.

Agents and Distributors for

E. Leitz—Microscopes; E. Merck's Chemicals and Stains;
Dr. Grubler—Stains; Porcellanfabrik—Porcelain Goods; M. Bert—
Bohemian Glass Goods; Paul Bunge—Balances; Sartorius—
Balances, etc.

BEST HOUSE IN INDIA

A R T P R E S S

for

SUPERIOR PRINTING

MODERATE CHARGES

PROMPTNESS



31. CENTRAL AVENUE, CALCUTTA

